

Operating Manual

Version 1.0

Surface and cylindrical grinding machine

OPTigrind[®]
GCM 205

Part no. 3121005



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Preface

Dear customer,

Thank you very much for purchasing a product made by OPTIMUM.

OPTIMUM metal working machines offer a maximum of quality, technically optimum solutions and convince by an outstanding price performance ratio. Continuous enhancements and product innovations guarantee state-of-the-art products and safety at any time.

Before commissioning the machine please thoroughly read these operating instructions and get familiar with the machine. Please also make sure that all persons operating the machine have read and understood the operating instructions beforehand.

Keep these operating instructions in a safe place nearby the machine.

Information

The operating instructions include indications for safety-relevant and proper installation, operation and maintenance

of the machine. The continuous observance of all notes included in this manual guarantee the safety of persons and of the machine.

The manual determines the intended use of the machine and includes all necessary information for its economic operation as well as its long service life.

In the paragraph "Maintenance" all maintenance works and functional tests are described which the operator must perform in regular intervals.

The illustration and information included in the present manual can possibly deviate from the current state of construction of your machine. Being the manufacturer we are continuously seeking for improvements and renewal of the products. Therefore, changes might be performed without prior notice. The illustrations of the machine may be different from the illustrations in these instructions with regard to a few details. However, this does not have any influence on the operability of the machine.

Therefore, no claims may be derived from the indications and descriptions. Changes and errors are reserved!

Your suggestion with regard to these operating instructions are an important contribution to optimising our work which we offer to our customers. For any questions or suggestions for improvement, please do not hesitate to contact our service department.

If you have any further questions after reading these operating instructions and you are not able to solve your problem with a help of these operating instructions, please contact your specialised dealer or directly the company OPTIMUM.

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1 Safety

This part of the operating instructions

- explains the meaning and use of the warning notes included in these operating instructions,
- defines the intended use of the grinding machine,
- points out the dangers that might arise for you or others if these instructions are not observed,
- informs you about how to avoid dangers.

In addition to these operating instructions, please observe

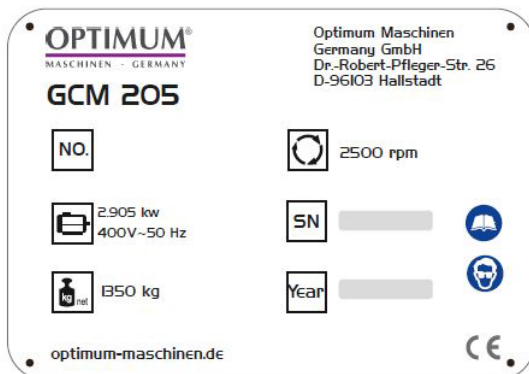
- the applicable laws and regulations,
- the statutory provisions for accident prevention,
- the prohibition, warning and mandatory signs as well as the warning notes on the grinding machine.

Always keep this documentation close to the grinding machine.

1.1 Glossary of symbols

- ▶ provides further instructions
- calls on you to act
- listings

1.2 Rating plate



1.3 Safety instructions (warning notes)

1.3.1 Classification of hazards

We classify the safety warnings into different categories. The table below gives an overview of the classification of symbols (ideogram) and the warning signs for each specific danger and its (possible) consequences.

Symbol	Alarm expression	Definition / consequence
	DANGER!	Impending danger that will cause serious injury or death to people.
	WARNING!	A danger that can cause serious injury or death.
	CAUTION!	A danger or unsafe procedure that can cause personal injury or damage to property.
	ATTENTION!	Situation that could cause damage to the grinding machine and product, as well as other types of damage. No risk of injury to persons.
	INFORMATION	Practical tips and other important or useful information and notes. No dangerous or harmful consequences for people or objects.

In case of specific dangers, we replace the pictogram with



general danger



with a warning of



injury to hands,



hazardous electrical voltage,



Risk of impact, danger of crushing

1.3.2 Other pictograms



Activation forbidden!



Do not get on the machine!



Do not extinguish with water!



Do not clean with compressed air!



Wear safety shoes!



Use ear protection!



Wear protective glasses!



Wear protective gloves!



Warning: biological hazard!



Warning: suspended loads!



Warning of oxidizing substances!



Caution, danger of explosive substances!



Warning: danger of slipping!



Protect the environment!



Contact address

1.4 Intended use

WARNING!

In the event of improper use, the grinding machine

- o this may result in hazards for personnel,
- o the grinding machine and other material property of the operating company will be endangered,
- o the functionality of the grinding machine may be compromised.

The grinding machine is used exclusively for precision grinding of round workpieces, flat workpieces made of steel or milling tools. The grinding machine must only be installed and operated in a dry and well-ventilated areas. The machine integrated coolant system is only intended for water-miscible cooling lubricants.

The grinding machine is designed and constructed for use in non-explosive environments.

If the grinding machine Grinding machine any way other than described above, modified without authorization of Optimum Maschinen Germany GmbH, then the grinding machine is being used improperly.

We will not be held liable for any damages resulting from any operation which is not in accordance with the intended use.

We expressly point out that the guarantee or CE conformity will expire, if any constructive, technical or procedural changes are not performed by the company Optimum Maschinen Germany GmbH.

It is also part of intended use that

- o the limits of performance of the grinding machine are observed,
- o observe the operating instructions,
- o the inspection and maintenance instructions are observed.

WARNING!

Extremely severe injuries due to non-intended use.

It is forbidden to make any modifications or alternations to the operating parameters values of the grinding machine. They could pose an accident hazard to persons and cause damage to the grinding machine.

1.5 Reasonably foreseeable misuse

Any use other than that specified under "Intended use" or any use beyond that described will be deemed non-intended use and is not permissible.

Any other use must be discussed with the manufacturer.



Only metallic, cold and non-flammable materials may be machined with the grinding machine.
In order to avoid misuse, it is necessary to read and understand the operating instructions before first commissioning.
Operators must be duly qualified.

1.5.1 Avoiding misuse

- Regularly check the grinding wheel clamping and the concentricity of the grinding wheel.
- Adaptation of the oscillating speed and the transverse feed to the material and the workpiece.
- Fasten the workpiece firmly and vibration-free between the centres with the aid of a driver, or use a lathe chuck (not included) for internal grinding.
- Use a vice or magnetic table for surface grinding workpieces.
- Risk of fire and explosion due to the use of flammable materials or cooling lubricants.
Before processing inflammable materials (e.g. aluminium, magnesium) or using inflammable auxiliary materials (e.g. spirit), you need to take additional preventive measures in order to avoid health risks.

1.6 Possible dangers caused by the grinding machine

The grinding machine was tested for operational safety. The construction and type are state of the art.

Nevertheless, there is a residual risk, as the grinding machine operates with

- rotating parts,
- electrical voltage and currents,
- a hydraulic table feed.

We have minimized the risk to people's health from these hazards through design and safety technology.

If the grinding machine is used and maintained by personnel who are not duly qualified, there may be a risk resulting from its incorrect or unsuitable maintenance.

INFORMATION

Everyone involved in the assembly, commissioning, operation and maintenance must

- be duly qualified,
- and strictly follow these operating instructions.

In the event of improper use

- there may be a risk to personnel,
- can endanger the grinding machine and other material assets,
- the functionality of the grinding machine may be compromised.

Always switch off the grinding machine and disconnect it from the mains, when cleaning or maintenance work is carried out.

WARNING!

The grinding machine may only be used with fully functional safety devices. Disconnect the grinding machine immediately, whenever you detect a failure in the safety devices or when they are not fitted!

All additional parts of the machine which had been added by the customer need to be equipped with the prescribed safety devices.

This is your responsibility being the operating company! ► Safety devices on page 10



1.7 Personnel qualification

1.7.1 Target group

This manual is addressed to

- the operating companies,
- operators having sufficient specialist knowledge,
- the maintenance personnel.

Consequently, the warning notes refer both to the use of the grinding machine and to its maintenance.

Determine clearly and explicitly who will be responsible for the different activities on the grinding machine (operation, setting up, maintenance and repair). Please note the name of the responsible person into an operators' log.

INFORMATION

Unclear responsibilities constitute a safety risk!

Always lock the main switch after switching off the grinding machine. This will prevent it from being used by unauthorized persons.

The qualifications of the personnel for the different tasks are mentioned below:

Operator

The operator has been instructed by the operating company regarding the assigned tasks and possible risks in case of improper behaviour. The user may only carry out tasks that exceed normal operation if this is stated in these instructions and the operator has explicitly entrusted him with the task.

Qualified electrician

With professional training, knowledge and experience as well as knowledge of respective standards and regulations, qualified electricians are able to perform work on the electrical system and recognise and avoid any possible dangers.

Qualified electricians have been specially trained for the working environment, in which they are working and know the relevant standards and regulations.

Qualified personnel

Due to their professional training, knowledge and experience as well as knowledge of relevant regulations, qualified personnel are able to perform the assigned tasks and to independently recognise and avoid any possible dangers.

Instructed person

Instructed persons were instructed by the operating company regarding the assigned tasks and any possible risks of improper behaviour.

1.7.2 Authorized personnel

INFORMATION

Specialist knowledge of cylindrical grinding machines and surface grinding machines is required for working on the grinding machine. Without the necessary training, nobody may work on the machine, even for a short time.

WARNING!

Inappropriate operation and maintenance of the grinding machine constitutes a danger for the personnel, objects and the environment.

Only authorized personnel may operate the grinding machine!



Persons authorized to operate and maintain should be trained technical personnel and instructed by the ones who are working for the operating company and for the manufacturer.

Obligations of the operating company

- train the personnel,
- instruct the personnel in regular intervals (at least once a year) on
 - all safety regulations relevant to the grinding machine,
 - operation of the grinding machine,
 - generally accepted engineering standards.
 - possible emergency situations,
- checking the level of knowledge of the personnel,
- documentation of the trainings/instructions in an logbook,
- require personnel to confirm participation in training/instructions by means of a signature,
- checking whether the personnel is working safety and risk-conscious and observes the operating instructions.
- define and document the inspection deadlines for the machine in accordance§ the Factory Safety Act and perform an operational risk analysis in accordance with the Work Safety Act.

Obligations of the operator

- have obtained a training regarding the handling of the grinding machine,
- keep an operator's log,
- before taking the machine in operation
 - have read and understood the operating manual,
 - be familiar with all safety devices and safety regulations.

Additional requirements apply to work on the following grinding machine parts:

- Electric components or operating materials: They must only be performed by a qualified electrician or person working under the instructions and supervision of a qualified electrician.

1.8 Operator positions

The user position is in front of the grinding machine. When using the handwheel servo valve, the operator is located laterally behind the machine.

1.9 Safety devices

The grinding machine must only be operated with fully functional safety devices.

Stop the grinding machine immediately if there is a failure on the safety device or becomes ineffective.

It is your responsibility!

If a safety device has been deactivated or is defective, the grinding machine can only be used again if you

- have eliminated the cause of the malfunction,
- have satisfied yourself that it does not pose any danger to persons or property.

WARNING!

If you bypass, remove or otherwise disable a safety device, you endanger yourself and other people working on the grinding machine. The possible consequences include:

- injuries due to tools, workpieces or fragments hereof which are flying off at high speed,
- contact with rotating or moving parts,
- fatal electrocution,
- pulling-in of clothes.



WARNING!

Although the isolating safety devices provided and delivered with the machine are designed to reduce the risks of coolants, workpieces being ejected or parts of tools, breaking off grinding wheel or workpieces breaking off, they cannot eliminate these risks completely. Always work carefully and observe the limit values of the grinding process.



The grinding machine features the following safety devices:

- a lockable master switch,
- two emergency stop button,
- a protective cover on the grinding wheel,
- an interlocked separating coolant splash guard on the grinding table.

1.9.1 Lockable master switch

In the "0" position, the lockable master switch can be secured against accidental or non-authorised switching on by means of a padlock.

The power supply is interrupted by switching off the master switch.

Except for the areas marked by the pictogram in the margin. In these areas there might be voltage, even if the master switch is switched-off.

WARNING!

Dangerous voltage even if the master switch is switched off.

The areas marked by the pictogram might contain live parts, even if the master switch is switched off.



1.9.2 Emergency stop button

CAUTION!

Only press the emergency-stop button in a genuine emergency. You may not use the emergency stop button to stop the machine during normal operation. The life time of the emergency stop button is not designed for operational shut-down of the machine.



CAUTION!

Depending on the mass moment of inertia the grinding wheel continues to rotate for a while.

The emergency stop button switches off the control voltage and thus stops the drives. Turn the knob to the right to unlock and release the emergency stop button.

The emergency stop switch is used to stop the grinding machine in an emergency.

After actuating, switch the control voltage back on.



1.9.3 Control-related safeguarding

WARNING!

If you bypass a control device, you endanger yourself and other people working on the grinding machine.

- injuries due to tools, workpieces or fragments hereof which are flying off at high speed,
- contact with rotating parts,
- fatal electrocution,
- pulling-in of clothes.

If, in exceptional cases (e.g. electrical repairs), you briefly bypass a control device, you must constantly monitor the grinding machine during this time.



1.9.4 Prohibition, warning and mandatory signs

INFORMATION

All warning and mandatory signs must be legible. They must be checked regularly.



1.10 Safety check

Check the grinding machine at least once per shift. Inform the person responsible immediately of any damage, defects or changes in the operating function.

Check all safety devices

- ☐ at the beginning of each shift (when the machine is operated continuously),
- ☐ once per day (during one-shift operation),
- ☐ once per week (when operated occasionally),
- ☐ after all maintenance and repair work.

Check whether the prohibition, warning and instruction signs and the markings on the grinding machine

- ☐ are legible (clean them, if necessary)
- ☐ and complete (replace them, if necessary).

INFORMATION

Organise the checks according to the following table;



General check		
Equipment	Check	OK
Protective housing on the grinding wheel	Not damaged and functional	
Signs, Markings	Installed and legible	
Grinding wheel	Grinding wheel dressed ?	
Grinding wheel with flange	Securely fastened ?	
Date:	Checked by (signature):	

Functional check		
Equipment	Check	OK
Emergency-stop pushbutton	After actuating the emergency stop switch, the grinding machine must switch off.	
Coolant splash guard on grinding table	The drives can only be switched on when the protective cover is closed.	
Date:	Checked by (signature):	

1.11 Personal protective equipment

For certain work, personal protective equipment is required.

Protect your face and your eyes: Wear a safety helmet with facial protection when performing work where your face and eyes are exposed to hazards.

Wear protective gloves when handling pieces or tools with sharp edges.

Wear safety shoes when you assemble, disassemble or transport heavy components.

Use ear protection if the noise level (emission) in the workplace exceeds 80 dB (A).

Before starting work make sure that the required personnel protective equipment is available at the work place.



CAUTION!

Dirty or contaminated personnel protective equipment can cause illness. They must be cleaned after each use and at least once a week.

1.12 Safety during operation

WARNING!

Before switching on the grinding machine, make sure that no persons are endangered and no objects are damaged.



Avoid any unsafe work methods:

- The instructions mentioned in these operating instructions have to be strictly observed during assembly, operation, maintenance and repair.
- Do not work on the grinding machine if your ability to concentrate is reduced for any reason, such as the influence of medication.
- The grinding machine may only be used for grinding workpieces made of metal. No combustible material or material made of wood or plastic may be used.
- Only use personnel with experience on such machines to operate and maintain the grinding machine.
- Before using the grinding machine for the first time, the operating instructions must be read.
- Before the grinding process, check the grinding wheel and its correct direction of rotation.
- Before starting the grinding machine, ensure sufficient safety clearance between the workpiece and the grinding wheel.
- The area around the grinding machine must be kept clean and dry. Remove waste and material removal.
- Never leave the grinding machine unattended during operation. Switch off the grinding machine before leaving.

1.13 Safety during maintenance

Inform the operators in good time of any maintenance and repair works.

Report all safety-relevant changes to the grinding machine or its operating behaviour. Any changes must be documented, the operating instructions updated and machine operators instructed accordingly.

1.14 Disconnecting and securing the grinding machine

Switch off the grinding machine at the main switch before starting maintenance and repair work.

Use a padlock to prevent the switch from being turned on without authorization and keep the key in a safe place.

All machine parts as well as all dangerous voltages are switched off.



Excepted are only the positions which are marked with the adjoining pictogram. These positions may be live, even if the main switch is switched off.

Attach a warning sign to the grinding machine.

WARNING!

Live parts and moves of machine parts can injure you or others dangerously!

Take extreme care if you do not switch off the grinding machine by turning off the master switch due to required works (e.g. functional control).

1.14.1 Using lifting equipment

WARNING!

The use of unstable lifting and load suspension gear that might break under load can cause severe injuries or even death. Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other supervisory authorities responsible for your company.

Check that the lifting and load-suspension equipment are of sufficient load-bearing capability and are in perfect condition. Fasten the loads carefully. Never walk under suspended loads!

1.14.2 Mechanical maintenance

Remove or install protection safety devices before starting or after completing any maintenance work; this include:

- ☐ covers,
- ☐ safety instructions and warning signs,
- ☐ grounding cables.

If you remove protective or safety devices, re-fit them immediately after the completing the work.

Check if they are working properly!

1.15 Accident report

Inform your supervisors and Optimum Maschinen Germany GmbH immediately in the event of accidents, possible sources of danger and any actions which almost led to an accident (near misses).

There are many possible causes for "near misses".

The sooner they are notified, the quicker the causes can be eliminated.

INFORMATION

We draw your attention to specific hazards when carrying out work with and on the grinding machine in the description of this work.

1.16 Electronics

Have the machine and/or the electric equipment checked regularly. Immediately eliminate all defects such as loose connections, defective wires, etc.

A second person must be present during work on live components to disconnect the power in the event of an emergency. Disconnect the machine immediately if there is a malfunction in the power supply!

Comply with the required inspection intervals in accordance with the factory safety directive, operating equipment inspection.

The operator of the machine must ensure that the electrical systems and operating equipment are inspected with regards to their proper condition, namely,



- by a qualified electrician or under the supervision and direction of a qualified electrician, prior to initial commissioning and after modifications or repairs, prior to recommissioning
- and at certain intervals.

The intervals must be set so that foreseeable defects can be detected in a timely manner, when they occur.

The relevant electro-technical rules must be followed during the inspection.

The inspection prior to initial commissioning is not required if the operator receives confirmation from the manufacturer or installer that the electrical systems and operating equipment comply with the accident prevention regulations, see conformity declaration.

Permanently installed electrical systems and operating equipment are considered constantly monitored if they are continually serviced by qualified electricians and inspected by means of measurements in the scope of operation (e.g. monitoring the insulation resistance).

1.17 Inspection deadlines

Define and document the inspection deadlines for the machine in accordance § 3 of the Factory Safety Act and perform an operational risk analysis in accordance with § 6 of the Work Safety Act. Also use the inspection intervals in the maintenance section as reference values.

1.18 Environmental protection and water conservation

Your grinding machine is a HBV-System according to § 19g Water Resources Act (System for the use of water hazardous substances)



When operating, shutting down or dismantling the grinding machine or parts thereof, the requirements of the Water Resources Act (WHG) must be observed. Detailed information regarding this can be found in the Ordinance on Installations for the Handling of Substances Hazardous to Water (VAWS).

1.19 Hydraulic system

The system is under a pressure of up to 1.2 MPa (12 bar). The hydraulic system is used for pendulum - table movement and automatic lubrication of machine parts at significantly lower pressure of 0.15 MPa (1.5 bar).

WARNING!

Serious injuries from hydraulic liquid escaping under high pressure!

Possible loss of the eyesight!



Make sure that the hydraulic system is depressurised before opening a component or a pipe. Wear protective goggles and protective clothing when working on the hydraulic system.

The hydraulic system might still be under pressure, even after the central power supply of the machine is switched off.

If you have got hydraulic fluid in your eyes, rinse them immediately with plenty of water. Immediately seek medical assistance.

2 Technical specifications

Main specification	
Electrical connected load	2.905 kW
Maximum swing diameter (centre height 100 mm)	200mm
Maximum workpiece length	500mm
Max. Weight of the grinding piece	10 kg
Capacity	
Workpiece diameter external grinding	Ø5 - Ø50 mm
Workpiece diameter internal grinding	Ø10 - Ø50 mm
Workpiece size	
Workpiece length external grinding	400mm
Workpiece length Internal grinding	75mm
Sharpening tools and cutters	Ø200 mm
Lathe chuck for internal grinding (not included in standard scope of delivery), lathe chuck flange	Ø100 mm
Grinding wheel	
External grinding, grinding wheel diameter (outer diameter x width x mounting hole)	Ø200 x 20 x Ø75
Internal grinding, grinding wheel diameter (outer diameter x width x mounting hole)	Ø25 x 20 x Ø6
	Ø10 x 10 x Ø3
Surface grinding	
Maximum surface for grinding	300mm x 125mm
Centre distance	
Between headstock and tailstock	430mm
Between left and right tailstock	500mm
Centre height	100mm
Tip cone	MT2
Speeds	
Working headstock, 3 speed levels (~50Hz connection)	110 200 300 rpm
Grinding spindle external grinding	2500 rpm
Grinding spindle internal grinding	13500 rpm
Grinding table	
Maximum rotation angle of the table	+45° ~ -30°
Maximum travel	480mm
Traversing speed per standard hydraulic circuit	0.1 - (6~8) m/min
Travel speed via servo valve control (handwheel on rear)	≤ 7 m/min
Handwheel travel	
Vertical feed (grinding head) per revolution of the handwheel	2mm
Per division of the handwheel	0.01mm
Cross feed (grinding table) per turn of the handwheel, fine / coarse	1 / 4 mm
Per division of the handwheel, fine / coarse	0.005 / 0.02 mm
Grinding head, grinding head support	

Maximum movement of the grinding head support vertical / horizontal	200 mm / 200 mm
Maximum rotation angle of the grinding head	+90° ~ -90°
Tailstock	
Tip cone	MT2
Spindle sleeve travel	14mm
Hydraulic system	
Working pressure	0.8 ~ 1.2 MPa
Auxiliary pressure	0.5 ~ 0.6 MPa
Lubrication pressure	0.08 ~ 0.15 MPa
Coolant pump	
Flow unthrottled at stopcock	22 litres / min.
Drive capacities	
Grinding wheel motor	1.1 kW
Motor headstock	0.18 kW
Oil pump motor (hydraulics)	0.75 kW
Coolant pump motor	0.125 kW
Motor optional dust extraction	0.75 kW
Machine dimension	
Length x width x height (without possible table movement)	1520 mm x 1142mm x 1338mm
Net machine weight	1350 kg
Work area	
Keep a work area of at least one metre around the machine free for operation and maintenance.	
Sound pressure level at 1 m distance from the machine and 1.60 m above the ground. (~50Hz connection)	78 - 82 dB(A)
Operating material	► Lubricant on page 38

INFORMATION SOUND PRESSURE LEVEL

The specified numerical value represents the emission level and does not necessarily a safe working level. Although there is a correlation between the level of noise emission and the level of noise exposure, it cannot be used reliably to determine whether or not further protective measures are necessary. Factors influencing the actual level of exposure of workers include the characteristics of the work area and other noise sources, i.e. the number of machines and other processes taking place nearby, and the length of time an operator is exposed to the noise. Furthermore, the permissible exposure level may vary from country to country. However, this information enables the user of the machine to make a better assessment of the hazards and risks.



CAUTION!

Depending on the overall noise exposure and the basic threshold values, machine operators must wear appropriate hearing protectors.



3 Delivery, interdepartmental transport, assembly and commissioning

3.1 Notes on transport, installation, commissioning

Improper transport, installation and commissioning is liable to accidents and can cause damage or malfunctions to the machine for which we do not assume any liability or guarantee.

Transport the scope of delivery secured against shifting or tilting with a sufficiently dimensioned industrial truck or a crane to the installation site.

WARNING!

Severe or fatal injuries may occur if parts of the machine tumble or fall down from the forklift truck or from the transport vehicle. Follow the instructions and information on the transport box.

Note the total weight of the machine. The weight of the machine is indicated in the "Technical data" of the machine. When the machine is unpacked, the weight of the machine can also be read on the rating plate.

Only use transport devices and load suspension gear that can hold the total weight of the machine.



WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death. Check that the lifting and load suspension gear has sufficient load-bearing capacity and that it is in perfect condition.

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company. Fasten the loads properly.



3.1.1 General risks during internal transport

WARNING: TILTING DANGER!

The machine may be lifted unsecured by a maximum of 2 cm.

Employees must be outside the danger zone, i.e. the reach of the load.

Warn employees and advise them of the hazard.

Machines may only be transported by authorized and qualified persons. Act responsibly during transport and always consider the consequences. Refrain from daring and risky actions.

Gradients and descents (e.g. driveways, ramps and the like) are particularly dangerous. If such passages are unavoidable, special caution is required.

Before starting the transport check the transport route for possible danger points, unevenness and faults.

Danger points, unevenness and disturbance points must be inspected before transport. The removal of danger spots, disturbances and unevenness at the time of transport by other employees leads to considerable dangers.

Careful planning of interdepartmental transport is therefore essential.



3.2 Assembly and commissioning

INFORMATION

The grinding machine is delivered pre-assembled. The delivery takes place in transport boxes. After unpacking and transport to the installation site, individual components of the grinding machine must be assembled and joined together.



3.3 Unpacking the machine

Install the machine close to its final position before unpacking. The machine is delivered in several packages. If a package shows signs of possible transport damage, take appropriate precautions not to damage the machine when unpacking. If damage is discovered, the carrier and/or shipper must be notified immediately so the necessary steps can be taken to register a complaint.

Examine the complete machine carefully and check whether all materials, such as shipping documents, instructions and accessories have been delivered with the machine.

3.3.1 Standard accessories

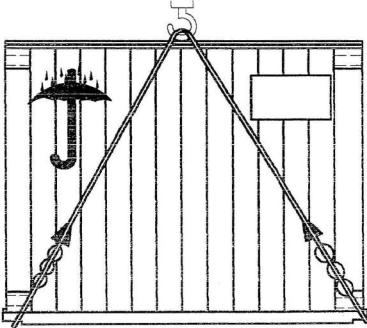
- ☐ 4 pcs. grinding wheel
- ☐ Internal cylindrical grinding tools
- ☐ Flange for three-jaw chuck (internal grinding)
- ☐ Centre point headstock
- ☐ Centre point tailstock
- ☐ Tailstock left side
- ☐ Collet
- ☐ Grinding wheel clamping disc
- ☐ Grinding wheel cover
- ☐ Extended shaft
- ☐ Coolant device

3.3.2 Optional available accessories

- ☐ Cutter head grinding device
- ☐ Dust extraction (Vacuum cleaner)
- ☐ Magnetic table for surface grinding
- ☐ Grinding wheel corrector
- ☐ Flat grinding device
- ☐ Cutter tooth support
- ☐ Grinding wheel balancer
- ☐ Universal grinding wheel corrector
- ☐ Universal grinding frame

3.4 Load stop

3.4.1 in the packed state

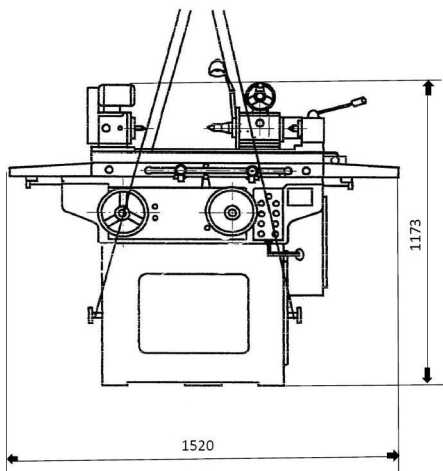


3.4.2 in the unpacked state

The machine can only be lifted at the load stops. Lifting the machine below the machine base with a forklift truck or lift truck is not permitted.

For transport, the grinding machine must be secured on the loading area in accordance with the regulations. All loose parts must either be firmly attached to the machine, separately secured or stowed in a separate, secure container.

The grinding machine may only be loaded and unloaded by qualified personnel.



Pay particular attention when transporting with a crane:

- Raise the machine at the lowest possible speed.
- Make sure the machine is balanced.
- Cover the machine in places where contact with the transport ropes may occur.
- The transport ropes must not touch the machine saddle to avoid damage to the saddle guides.
- During transport, no persons may stay closer than 2 metres to the machine.

During transport, there must be no impact or movement of the machine.

3.5 Set-up and assembly

ATTENTION!

Before you set up the machine, have the load-bearing capacity of the ground checked by a specialist. The floor or the hall ceiling must bear the weight of the machine plus all additional parts and units, as well as operators and stored materials. If necessary, the foundation must be reinforced.



3.6 Installation site requirements

When using liquid grinding additive or coolant lubricant:

In order to achieve sufficient safety against falls by slipping, the accessible area in the mechanical machining zone of the machine must be equipped with a slip resistance. The slip resistant mat and/or the slip resistant floor must be at least R11 according to BGR 181.

The used shoes must be suitable for being used in those machining areas. The accessible areas must be cleaned.

Design the working area around the grinding machine according to local safety regulations.

The work area for operation, maintenance and repair must not be restrictive.

INFORMATION

In order to achieve high levels of functionality and machining accuracy, as well as a long service life of the machine, the set-up location should meet certain criteria.



The following points should be noted:

- The machine must only be installed and operated in a dry and well-ventilated place.
- Avoid places near machines generating chips or dust.
- The installation site must be free from vibrations also at a distance of presses, planing machines, etc.
- The ground must be suitable for the grinding machine. Make sure that the floor has sufficient load-bearing capacity and is level.
- The ground must be prepared in such a way that any coolant used cannot penetrate the ground.
- Any parts sticking out such as stops, handles, etc. have to be secured by measures taken by the customer if necessary in order to avoid endangering persons.
- Provide enough space for set-up and operating personnel and material transport.
- Also bear in mind accessibility for installation and maintenance works.

INFORMATION

The main switch of the grinding machine must be freely accessible.



ATTENTION!

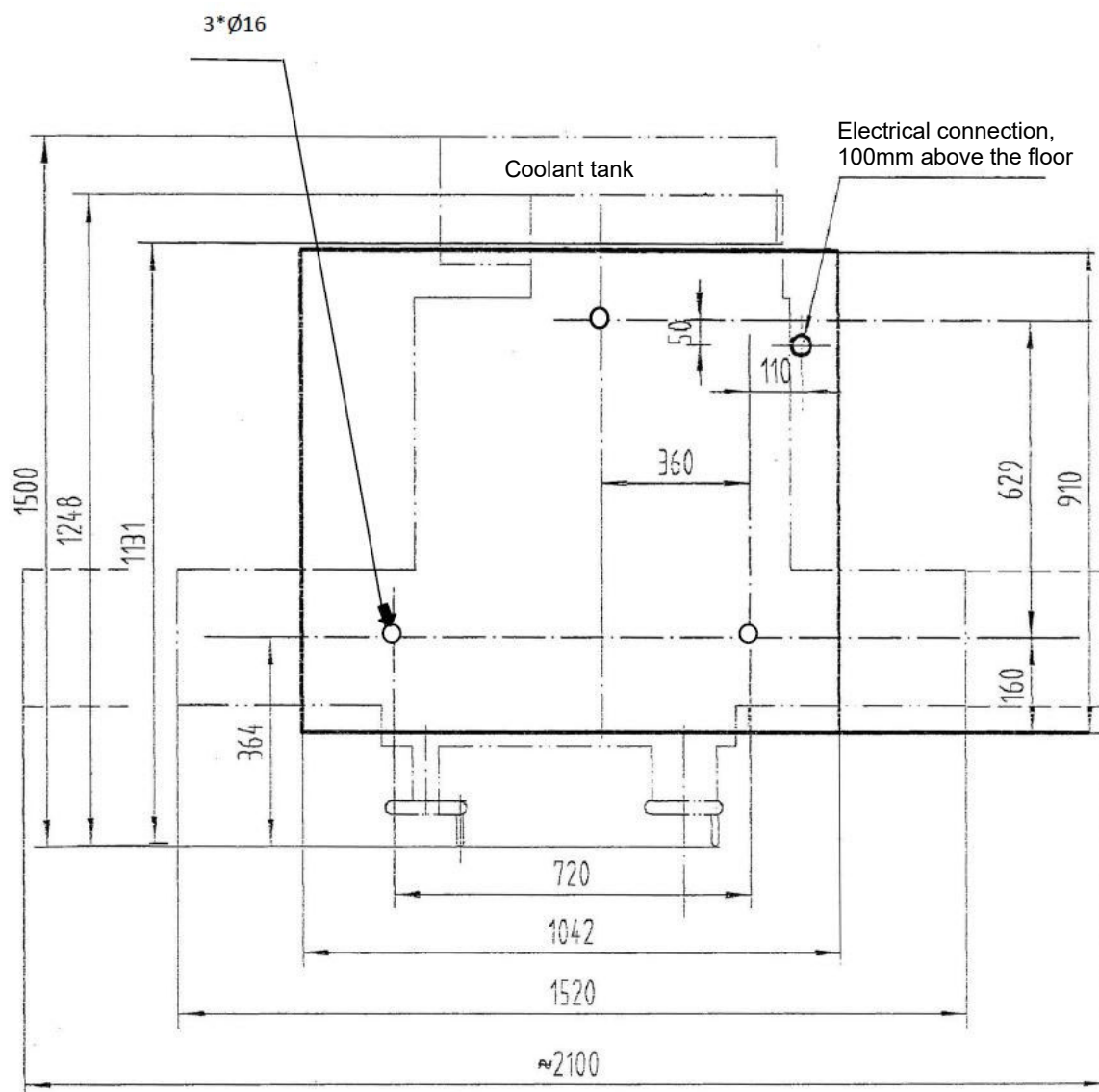
Ensure that only experienced personnel transport, set up and install the machine.



3.7 Installation plan, Anchored installation

After the machine has been roughly levelled, it must be accurately levelled and then bolted with foundation bolts at the 3 positions Ø16. The final precise setting must correspond to the accuracy values of the test report.

► Genauigkeitsbericht - Accuracy report on page 56



3.8 Cleaning the machine

ATTENTION!

Do not use compressed air to clean the machine.

Your new grinding machine must be completely cleaned after unpacking in order to ensure that the moving parts and sliding surfaces cannot be damaged during operation of the machine. Before delivery, all bare parts and sliding surfaces of each unit are lubricated accordingly in order to protect them against rust in the period before commissioning. Remove all wrappings and clean all surfaces with a degreaser to soften and remove the protective greases and coatings.

Wipe all surfaces with a clean cotton cloth.



4 Operation

The grinding machine is a universal surface and cylindrical grinding machine as well as a universal tool grinding machine for internal and external grinding of cylindrical and conical workpieces, it is also suitable for grinding flat, vertical, inclined and grooved surfaces.

With special accessories it is possible to grind straight-toothed grooves, hobs, drills, and general tools such as cutters, reamers and cutting tools.

The grinding wheel shaft is easily adjustable. The table can be moved back and forth automatically by a hydraulic drive, or operated easily and flexibly by the manual hydraulic overtravel mechanism (servo control). The integrated hydraulics also provide automatic lubrication.

The universal surface and cylindrical grinding machine is suitable for tool shops, maintenance workshops and scientific research facilities.

4.1 Safety

Only operate the grinding machine under the following conditions:

- The technical condition of the grinding machine is perfect.
- The grinding machine is used as intended.
- The operating instructions are observed.
- All safety devices are installed and activated.

Eliminate or have all malfunctions rectified promptly. In the event of malfunctions, stop the grinding machine immediately and secure it against unintentional or unauthorised operation. Notify the person responsible immediately of any modification.

- Safety check on page 12 , ► Safety during operation on page 13



4.2 Control and indicating elements



Img. 4-1:

Pos.	Designation	Pos.	Designation
1	Speed selection working headstock (Abbildung 4-2)	2	Front control panel for drives (Abbildung 4-3)
3	Grinding drive control panel on the side (not visible) and accessory connections	4	Machine light
5	Grinding wheel external grinding, grinding head	6	Grinding head height adjustment for face grinding
7	Sliding door	8	Start-stop rotary valve, speed adjustment
9	Rotary valve for activating the handwheel servo valve (rear) or the hydraulic standard table feed	10	Optional dust extraction (Abbildung 4-2)
11	Pendulum movement End position switching Table feed (longitudinal movement)	12	Handwheel cross feed (feed fine and coarse switchable)
13	Handwheel manual longitudinal movement	14	Manual handwheel Servo valve (Abbildung 4-2)

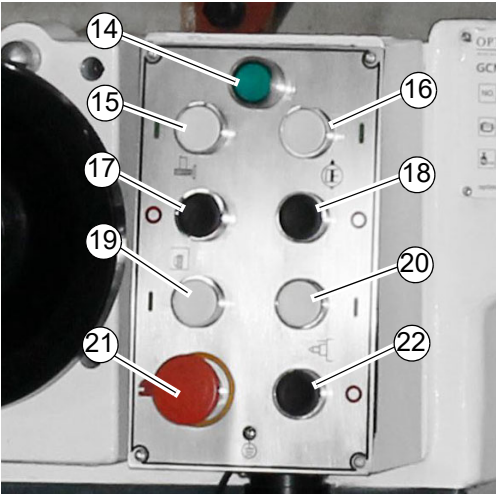


Img. 4-2:

Pos.	Designation	Pos.	Designation
1	Speed selection working headstock	2	Front control panel for drives (Abbildung 4-3)
3	Grinding drive control panel on the side (not visible) and accessory connections	4	Machine light
5	Grinding wheel external grinding, grinding head (Abbildung 4-1)	6	Grinding head height adjustment for surface grinding (Abbildung 4-1)
7	Sliding door	8	Start-stop rotary valve, speed adjustment
9	Rotary valve for activating the handwheel servo valve (rear) or the hydraulic standard table feed	10	Optional dust extraction
11	Pendulum movement End position switching Table feed (longitudinal movement)	12	Handwheel cross feed (feed fine and coarse switchable)
13	Handwheel manual longitudinal movement	14	Manual handwheel Servo valve

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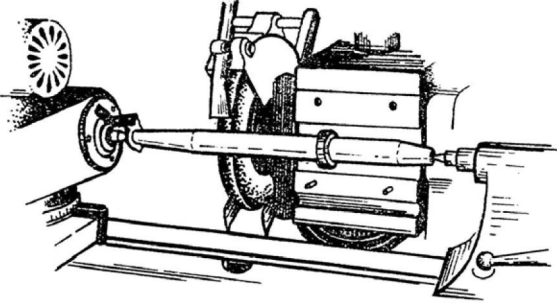
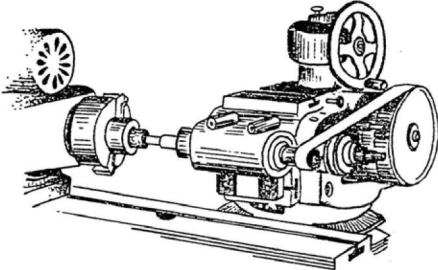
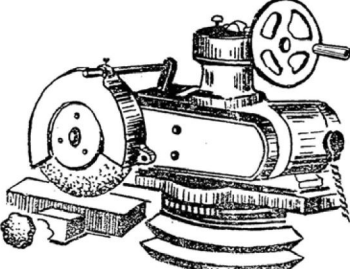
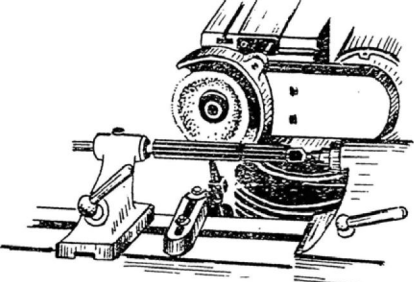
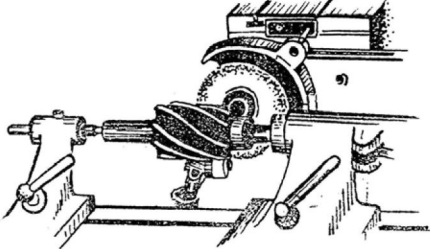
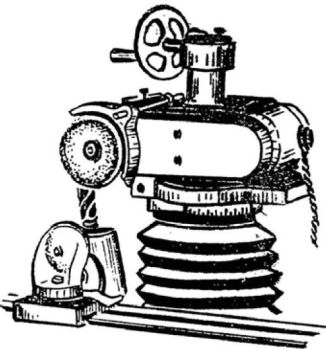
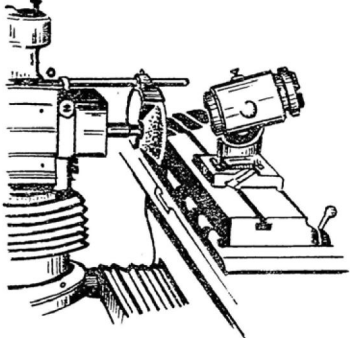
4.3 Control panel



Img. 4-3:

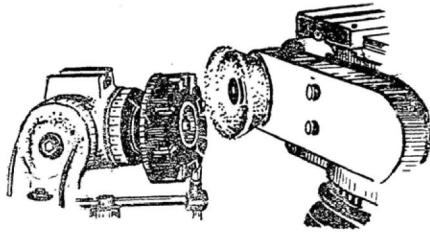
Pos.	Designation	Pos.	Designation
14	Control On		
15	Grinding wheel rotation clockwise <ON>	16	Oil pump (hydraulics) <ON>
17	Grinding wheel rotation <OFF>	18	Oil pump (hydraulics) <OFF>
19	Grinding wheel rotation counter-clockwise <ON>	20	Headstock drive <ON>
21	Emergency-stop	22	Headstock drive <OFF>

4.4 Machining possibilities

External grinding 	Internal grinding 
Surface grinding 	Grinding a sawtooth cutter  (only possible with optional accessories)
Grinding a reamer 	Grinding a spiral cutter 
Grinding an end mill with taper shank  (only possible with optional accessories)	 (only possible with optional accessories)

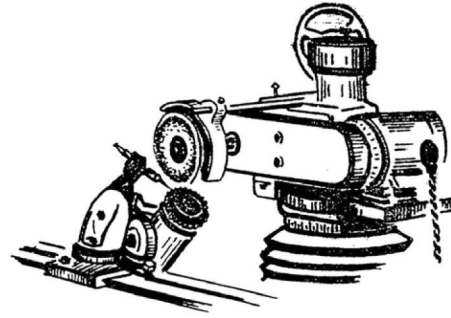
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Sharpening a face milling cutter



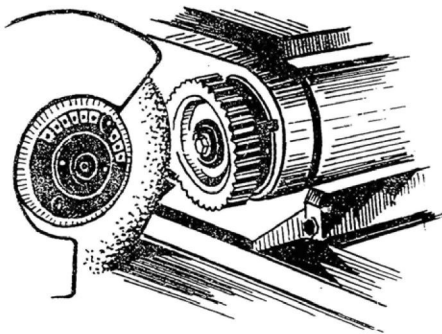
(only possible with optional accessories)

Grinding an angle cutter



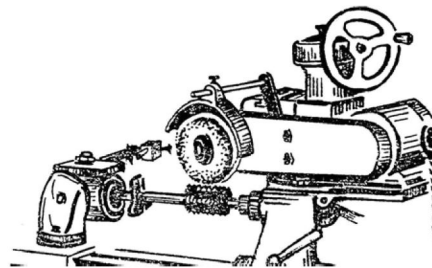
(only possible with optional accessories)

Gear cutter grinding



(only possible with optional accessories)

Sharpening of a straight hob cutter



(only possible with optional accessories)

4.5 Most important devices and their use

Cutter head device

This unit is used for grinding taper shank cutters and some taper arbor mounted cutters. If the spindle does not need to rotate during work, it can be fixed with the locking screw.

Left tailstock

It is used for grinding reamers and other tools mounted on the mandrel. It is generally used in combination with the right tailstock.

Device for grinding surfaces (optional)

It is used for sharpening turning tools and some flat surfaces of other tools.

Grinding wheel dresser

This device is used for dressing cylindrical and flat surfaces of grinding wheels.

Centre height measuring device

The centre height gauge is used to set the grinding wheel spindle and the tailstock centre to the same height. When aligning, the tool to be ground should be exactly aligned with the marking plate in front of the grinding wheel head.

Cutter tooth support (optional)

This device is used to precisely align the cutting teeth to be sharpened with the grinding wheel and ensures that the cutting edge is fixed in a certain position and does not bend during grind-

ing. At the end part of the tooth support there are steel plates in three shapes suitable for different cutters.

Extended spindle

To avoid a collision of the grinding wheel head with the table, an extended spindle is prepared on the right side of the grinding wheel spindle, which is used for grinding the face of the workpiece clamped in the vice.

Grinding wheel balancing stand (optional)

The balancing stand is used to balance the grinding wheel. The horizontality of the balancing stand itself can be adjusted with the spirit level and the adjusting screw.

Common hydraulic system

This system allows the table to be moved back and forth and enables automatic lubrication.

The hydraulic system consists of the common hydraulic drive and the manual hydraulic servo drive. These two systems are locked against each other by means of the rotary slide.

Automatic lubrication

The following machine parts, including the longitudinal guide, the transverse guide, the column guide with its spindle and nut and the spindle of the transverse guide and nut are all automatically lubricated.

4.6 Back and forth movement of the table

Standard Hydraulic circuit

First turn the rotary valve to the hydraulic drive position, then switch on the oil pump and the lever of the start-stop valve. The pressure oil is fed separately into the control box, pressure reducing valve, pressure switch, lubricant stabiliser and oil cylinder, with the oil circuit for driving the table leading from the rotary valve section to the left chamber of the oil cylinder and then enabling the table to move to the right.

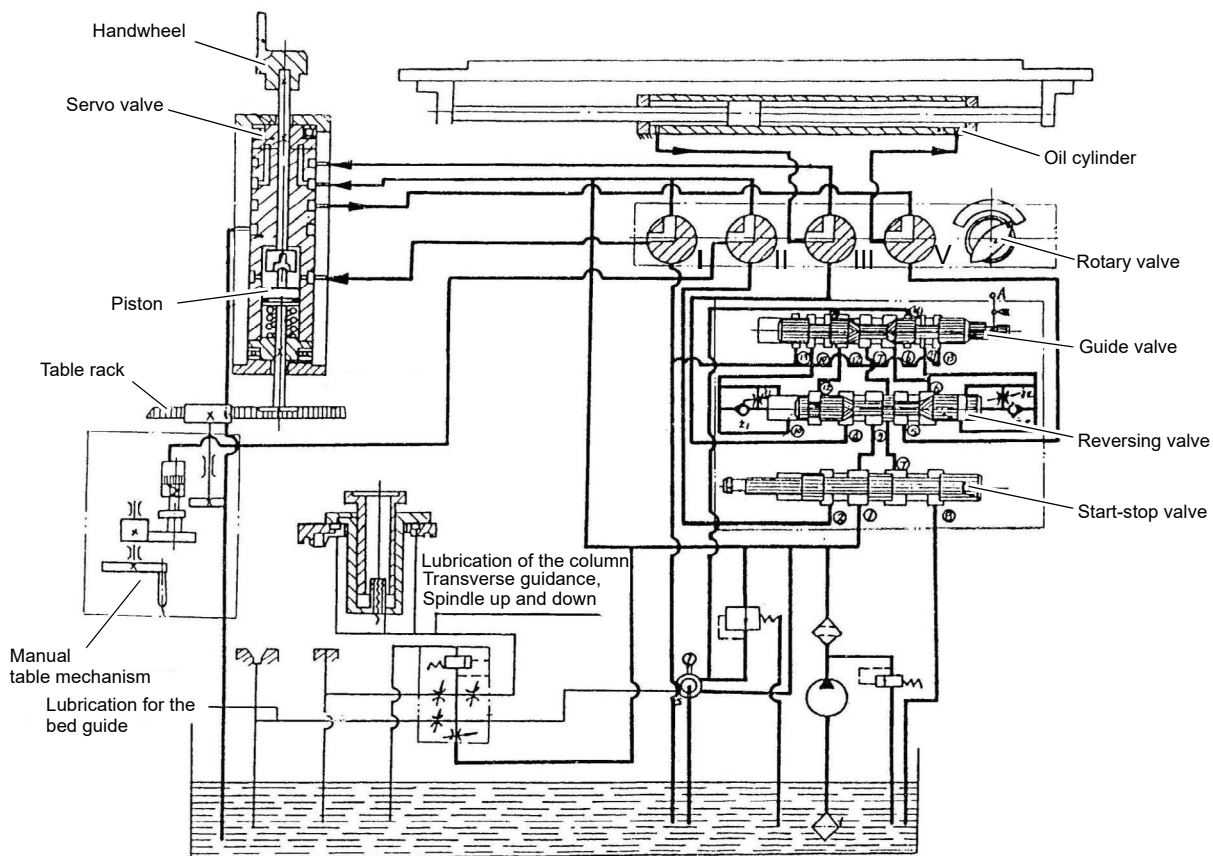
When the table moves to the right to the set position, the driver collides with the change-over lever and the guide valve moves from its right position, so that the control oil flow in the hydraulic change-over valve changes direction. In this case, the oil flows through the pump, the oil filter and the pressure reducing valve and pushes the change-over valve to the left. Meanwhile, the oil in the left chamber of the change-over valve flows through the fast oil path into the oil tank. The changeover valve shown in the illustration therefore moves from the right to the left position. This allows the main oil flow to be reversed, whereupon the table starts to move to the left until the table's follower bumps against the reversing lever, causing the reversal, so that the table automatically moves back and forth.

4.7 Function of the manual handwheel valve, rotary valve, servo valve

Handwheel Servo valve Hydraulic circuit (handwheel on the back)

The principle is as follows. When using the servo drive, the rotary valve is turned to the position shown in the illustration to interrupt the oil path between the oil cylinder and the control box and connect the oil cylinder to the servo drive valve. When the oil pump is put into operation, the oil flows in two ways through sections I and II of the rotary valve and the oil cylinder of the manual table mechanism and ensures that they lock together. When the handwheel handle is turned clockwise, the oil distribution plate rotates in the same direction and ensures that the oil inlet and outlet and the outlet of the oil pipe are connected to the left and right chambers of the cylinder accordingly. The pressurised oil coming from the oil pump therefore enters the left chamber of the oil cylinder through the arcuate grooves in the surface of the oil distribution plate, forming the circuit indicated by the arrow, so that the table can be moved to the right (as seen from the operator's position). The rack under the table is connected to the valve bushing via the return gear, the valve rack to the drum and guide bushing on top of it. When the table is moved, the valve bushing rotates and its direction of rotation corresponds to the direction of rotation of the oil distribution plate. In this way, the inlet and outlet are automatically closed and the system returns to its original state of central equilibrium. When the handwheel is no longer turned, the table stops. When the handwheel with the oil distribution plate is turned in the opposite direction, the table also moves in the opposite direction.

In this way, the operator can easily and directly meet his requirements by moving the table at any speed and stopping in any position.



5 Maintenance

In this chapter you will find important information about

- Inspection
- Maintenance
- Repair

of the grinding machine.

ATTENTION!

Properly performed regular maintenance is an essential prerequisite for

- operational safety,
- failure-free operation,
- a long working life of the grinding machine and
- the quality of the products which you manufacture.

Installations and equipment from other manufacturers must also be in good order and condition.



5.1 Operating material

5.1.1 Machine lubricants

Safe operation of the machine is only guaranteed if suitable lubricants are used. ► Operating material on page 17

5.1.2 Coolants

In order to avoid interferences during operation the coolant and the slideway oil or grease need to be compatible.

Read also: ► Cooling lubricants and tanks on page 39

INFORMATION

The grinding machine was painted with a **one-component lacquer**. Take this criterion into account when selecting your cooling lubricant.

The company Optimum Maschinen Germany GmbH does not assume any guarantee for subsequent damages due to unsuitable cooling lubricants.

The flashpoint of the emulsion must be higher than 140°C.

When using non-water-miscible cooling lubricants (oil content > 15%) with a flashpoint, ignitable aerosol air mixtures might develop. There is a potential danger of explosion.



ATTENTION!

Only the correct selection of suitable combinations of coolants and bed track oils and the correct care and maintenance of the coolant can ensure that no problems such as stick-slip effect or deposits occur.

The selection of coolants and bed track oils, lubricating oils or greases and their maintenance is determined by the machine user or operator.

Therefore Optimum Maschinen Germany GmbH cannot be held responsible for machine damages caused by unsuitable coolants and lubricants as well as insufficient care and maintenance of the coolant. If you have problems with the coolant and bed track oil or grease, please contact your mineral oil company.



5.2 Safety

WARNING!

The consequences of incorrect maintenance and repair work may include:



- o Serious injuries to persons working on the grinding machine,
- o damage to the grinding machine.

Maintenance and repair work on the grinding machine must be carried out by qualified technical personnel only.

Validation

Check and maintain all safety-relevant stop, control and measuring devices (validation).

Documentation

Record all tests and works in a operator's log resp. log book.

5.2.1 Preparation

WARNING!

Only work on the grinding machine when the main switch is switched off and secured with a padlock against being switched on again.

- Disconnecting and securing the grinding machine on page 13. Attach a warning label.



5.2.2 Restarting

Before restarting, run a safety check.

- Safety check on page 12

WARNING!

Before starting the grinding machine, make absolutely sure that there is no danger to persons and that the grinding machine will not be damaged.



5.3 Repair

5.3.1 Customer service technician

For any repair work request the assistance of an authorised customer service technician. Contact your specialist dealer if you do not have customer service's information or contact Stürmer Maschinen GmbH in Germany who can provide you with a specialist dealer's contact information. Optionally, Stürmer Maschinen GmbH ; Dr.-Robert-Pfleger-Str. 26 ; 96103 Hallstadt ; can provide a service technician, but the request for a service technician can only be made via your specialist dealer.

If the repairs are carried out by qualified technical personnel, they must follow the indications given in these operating instructions.

Optimum Maschinen Germany GmbH accepts no liability nor does it guarantee against damage and operating malfunctions resulting from failure to observe these operating instructions.

For repairs, only use

- o faultless and suitable tools only,
- o original parts or parts from series expressly authorised by Optimum Maschinen Germany GmbH.

5.4 Inspection and maintenance

The type and level of wear depends to a large extent on the individual usage and operating conditions. Any indicated intervals therefore are only valid for the corresponding approved conditions.

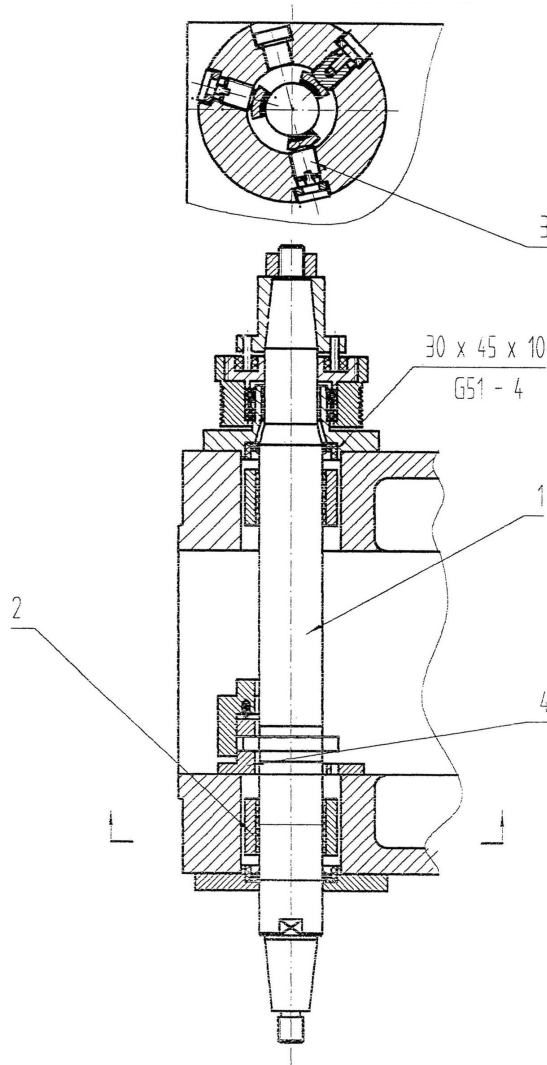
Interval	Where?	What?	How?	Check ✓
Start of work, after each maintenance or repair work	Grinding machine	► Safety check on page 12		
	Hydraulic system, lubrication system, Grinding spindle head, headstock	Fill level	► Lubrication schedule on page 38	
weekly	Coolant tank	Grinding sludge	Remove accumulation of grinding sludge.	
weekly	Coolant	Fill level, status control	 CAUTION ! The coolant must be checked for concentration, pH value, bacteria and fungal attack at least once a week, even when the machine is not in operation.	
		PH Value measurement	Check the pH value. If required, replace the cooling lubricant. ► Cooling lubricants and tanks on page 39 ► Inspection plan for water-mixed cooling lubricants on page 40	
Every 6 months Operating time	Hydraulic system and headstock		► Lubrication schedule on page 38	

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Interval	Where?	What?	How?	Check ✓
based on operator's historic values	Coolant circuit	Drain hose	Check the drain hose from the grinding table back into the coolant tank for deposits and blockages.	
Every 1000 operating hours	Electrical cabinet	Cleaning	Although the electrical cabinet is constructed to shut off external air, foreign particles such as dust and dirt may enter the cabinet when the door is open. Accumulation of foreign particles on the printed circuit boards or other electronic components could cause machine malfunction. Clean the inside of the electrical cabinet regularly. Remove dust inside electrical cabinet with a vacuum cleaner. Do not use compressed air to clean the electrical cabinet. Never touch circuit boards or parts around the connector. Also avoid hitting these parts with the vacuum. We recommend that the electrical cabinet is cleaned every 1000 operating hours.	
based on operator's historic values in accordance with German DGUV (BGV A3)	Electronics	Electrical inspection	► Obligations of the operating company on page 10 ► Electronics on page 14 ► Validation on page 32	

5.4.1 Exchange of the grinding spindle

The following figure shows the structure of the grinding spindle (1). If it is determined that the spindle needs to be replaced, note the numbers engraved on the bearing shoes (2) and the ball head screws (3). Interchanging shoes or screws is not permitted.



Img. 5-1:

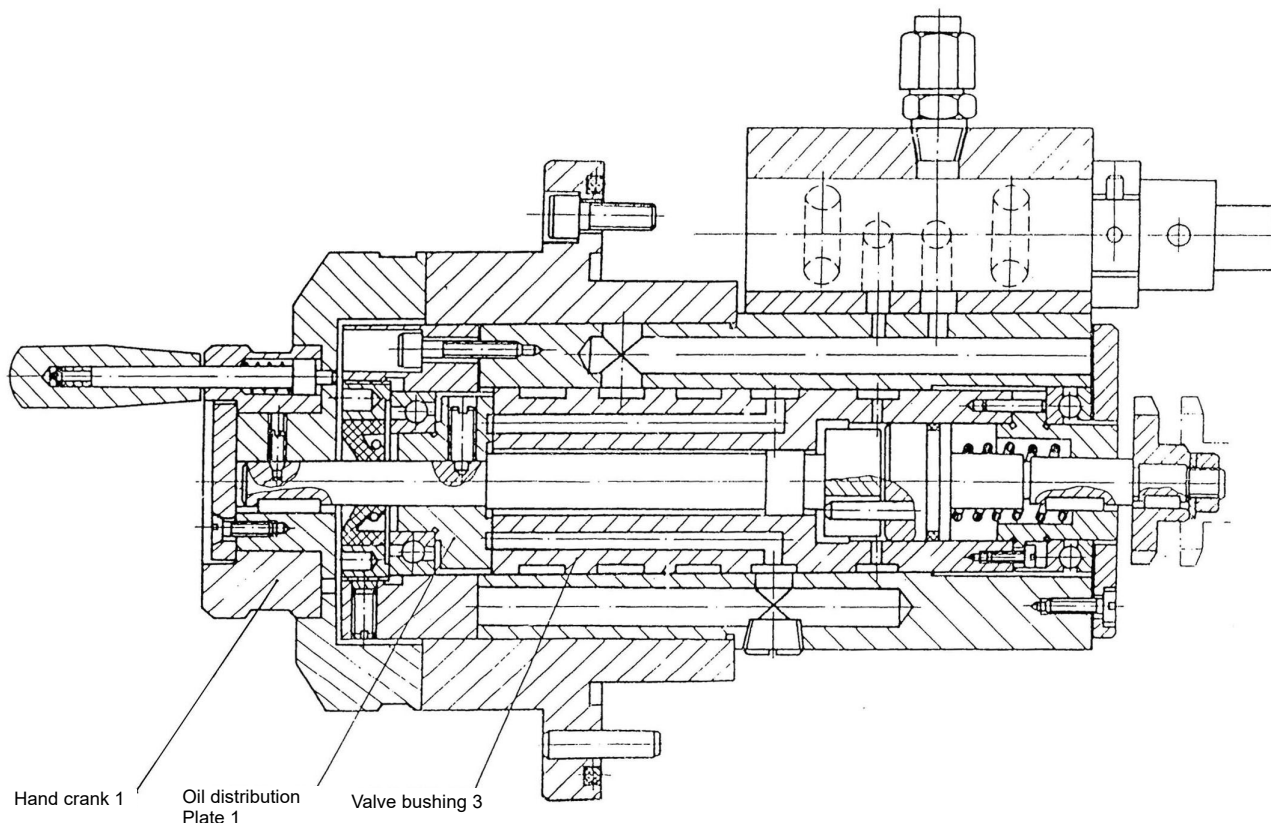
5.4.2 Manual hydraulic valve with servo drive

The valve is located on the left rear of the machine.

The control parts are on the right side of the illustration. The valve is a face valve. It consists of the crank handle (1), the oil distributor plate (2) and the valve bushing (3). There are eight holes in the right side of the valve bushing. Two of them, forming a pair, are offset by 180°. Four pairs of bores are separately connected to the oil inlet, the oil outlet, the left cylinder chamber and the right cylinder chamber. 4 arc-shaped grooves are located on the surface of the oil distribution plate. The radius of these grooves corresponds to the distribution radius of the eight holes in the face of the valve bushing. The distances between these four arc-shaped grooves cover exactly two oil inlet and two oil outlet holes. The remaining four holes leading to two sides of the oil cylinder are separated from each other so that the oil circuit is closed.

When the oil distribution plate is rotated through a certain angle, the four holes leading to the oil inlet and outlet are in communication with the four corresponding grooves, which means that two sides of the cylinder are in communication with the oil inlet and outlet. The moving piston drives the table and the rack, which rotate the feedback gear. This causes the valve to turn in

the same direction as the oil distribution plate. This closes the oil circuit again and the recirculation takes place. When the servo drive stops, the spring behind the piston pushes the piston away. This disengages the feedback gear from the rack and pushes the pin, which is attached to the head of the piston, into the groove of the shaft. In this way, the entire oil circuit is reliably locked when the servo drive is re-engaged and unintentional movement of the table is prevented.



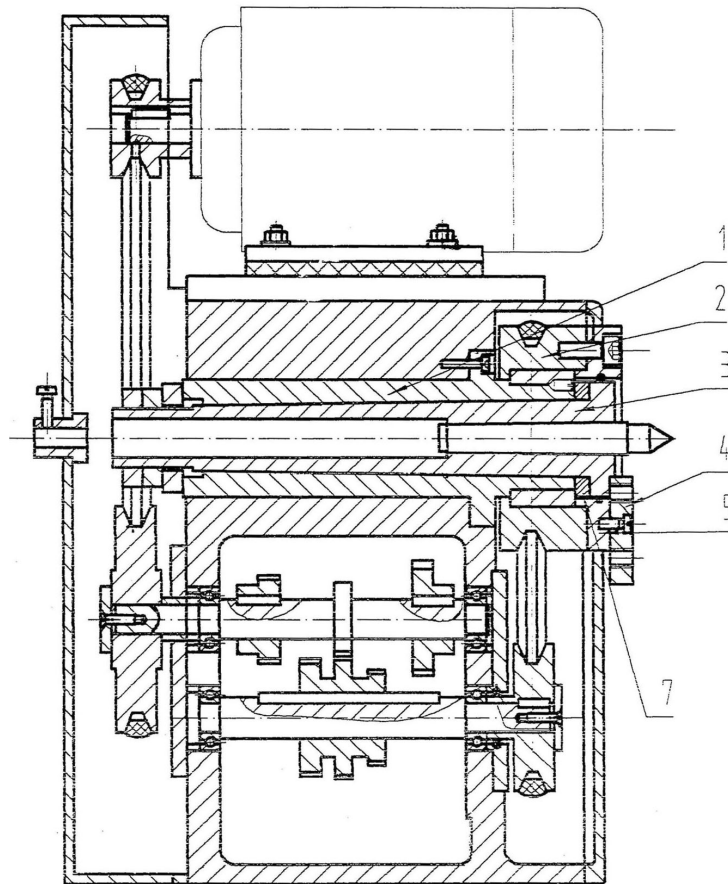
Img.5-2:

5.4.3 Bearing play of the headstock

The bearing play of the spindle is adjusted with the help of the adjustable disc (7). If wear between the spindle and bearing affects working accuracy, the spindle and adjustable washer should be removed and the bearing finely scraped by hand so that the contact points are not less than 13-16 points / 25×25mm².

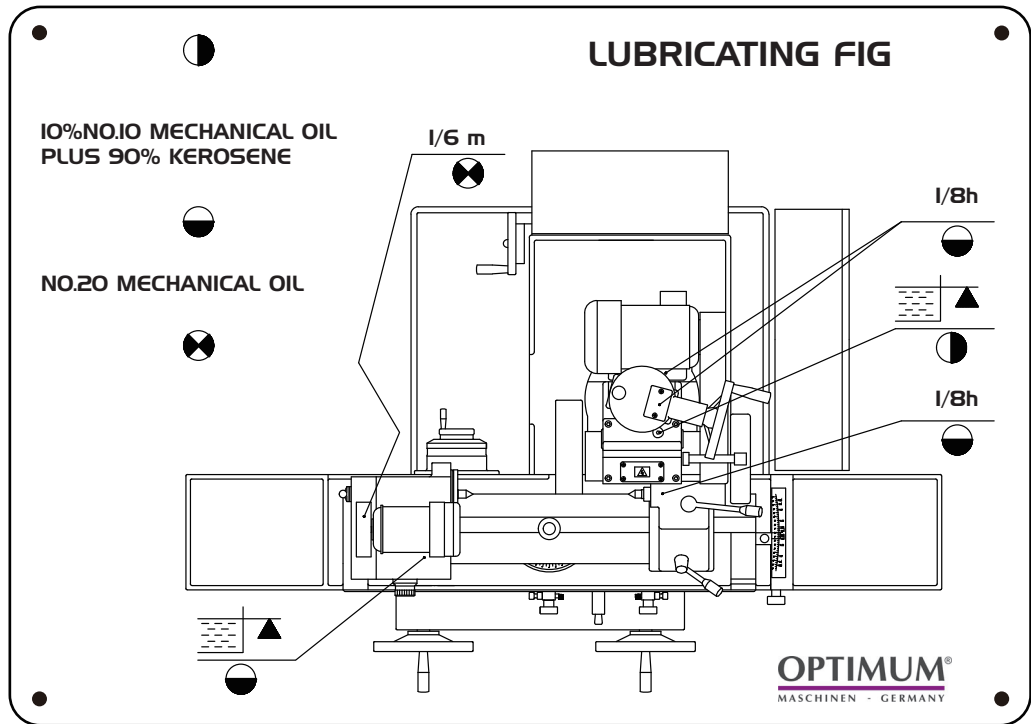
Then the thickness of the adjustable washer should be ground to match the actual measured axial clearance between the faces of the spindle and bearing to meet the requirements of points 5 and 7 of the accuracy protocol.

- Genauigkeitsbericht - Accuracy report on page 56



Img. 5-3:

5.5 Lubrication schedule



5.5.1 Lubricant

Position	Lubricants	Fill level control interval
Headstock	Basic filling with machine oil no. 10 with 90% kerosene (petroleum). Refill or complete replacement with spindle oil ISO VG10, e.g. Mobil Velocite Oil No 6	1/6m every 6 months Operating time
Grinding spindle head	Basic filling with machine oil no. 10 with 90% kerosene (petroleum). Refill or complete replacement with spindle oil ISO VG10, e.g. Mobil Velocite Oil No 6	1/8h every 8 hours of operation
Tailstock	Lubricate with ISO VG10 spindle oil, e.g. Mobil Velocite Oil No 6	1/8h every 8 hours of operation
Hydraulic system, lubrication system	Basic filling with machine oil no. 20 Refill or complete replacement with ISO VG20 hydraulic oil, e.g. Mobil Velocite Oil No 10	1/6m every 6 months Operating time
Cooling system	Coolant	according to test plan

5.6 Cooling lubricants and tanks

CAUTION!

The cooling lubricant can cause diseases. Avoid direct contact with cooling lubricant or parts covered in cooling lubricant.



Cooling lubricant circuits and tanks for water-cooling lubricant mixtures must be completely emptied, cleaned and disinfected as needed, but at least once per year or every time the cooling lubricant is replaced.

If fine chips and other foreign matters are accumulated in the coolant tank, the machine can no longer be correctly supplied with coolant. Furthermore, the lifetime of the coolant pump is reduced.

When processing cast iron or similar materials generating fine chips, cleaning the coolant tank more often is recommended.

Limit values

The cooling lubricant must be replaced, the cooling lubricant circuit and tank emptied, cleaned and disinfected if

- the pH value drops by more than 1 based on the value during initial filling. The maximum permissible pH value during initial filling is 9.3
- there is a perceivable change in the appearance, odour, floating oil or increase of the bacteria to more than 10/6/ml
- there is an increase in nitrite content to more than 20 ppm (mg/l) or nitrate content to more than 50 ppm (mg/l)
- there is an increase in the N-nitrosodiethanolamine (NDELA) to more than 5 ppm (mg/a)

CAUTION!

Comply with the manufacturer's specifications for mixture ratios, hazardous substances, e.g. system cleaners, including their permissible minimum use times.



CAUTION!

Since the cooling lubricant escapes under high pressure, pumping out the coolant by using the existing cooling lubricant pump via a pressure hose into a suitable tank is not recommended.



ENVIRONMENTAL PROTECTION

During work on the cooling lubricant equipment please make sure that

- collector tanks are used with sufficient capacity for the amount of liquid to be collected.
- liquids and oils should not be spilled on the ground.



Clean up any spilled liquid or oils immediately using proper oil-absorption methods and dispose of them in accordance with current statutory environmental regulations.

Collect leakages

Do not re-introduce liquids spilled outside the system during repair or as a result of leakage from the reserve tank, instead collect them in a collecting container for disposal.

Disposal

Never dump oil or other substances which are harmful to the environment into water inlets, rivers or channels. Used oils must be delivered to a collection centre. Consult your supervisor if you do not know where the collection centre is.

5.6.1 Inspection plan for water-mixed cooling lubricants

Company: No.: Date: used cooling lubricant			
size to be checked	Inspection methods	Inspection intervals	Procedure and comment
noticeable changes	Appearance, odour	daily	Find and rectify causes, e.g. skim off oil, check filter, ventilate cooling lubricant system
pH value	Laboratory techniques electrometric with pH meter (DIN 51369) Local measurement method: with pH paper (Special indicators with suitable measuring range)	weekly ¹⁾	if pH value decreases > 0.5 based on initial filing: Measures in accordance manufacturer's recommendations > 1.0 based on initial filing: Replace cooling lubricant, clean cooling lubricant circulation system
Usage concentration	Manual refractometer	weekly ¹⁾	Method results in incorrect values with tramp oil content
Base reserve	Acid titration in accordance with Manufacturer's recommendation	as required	Method is independent of tramp oil content
Nitrite content	Test sticks method or laboratory method	weekly ¹⁾	> 20 mg/L nitrite: Replace cooling lubricant or part or inhibiting additives; otherwise NDELA (N-nitrosodiethanolamine) in the cooling lubricant system and in the air must be determined > 5 mg/L NDELA in the cooling lubricant system: Replacement, clean and disinfect cooling lubricant circulation system, find nitrite source and, if possible, rectify.
Nitrate/nitrite content of the preparation water, if this is not removed from the public grid	Test sticks method or laboratory method	as required	Use water from the public grid if there is water from the public grid has > 50 mg/l nitrate: Inform the waterworks

¹⁾ The specified inspection intervals (frequency) are based on continuous operation. Other operational conditions can result in other inspection intervals; exceptions are possible in accordance with Sections 4.4 and 4.10 of the TGS 611.

Editor:

Signature:

6 Ersatzteile - Spare parts

6.1 Ersatzteilbestellung - Ordering spare parts

Bitte geben Sie folgendes an - *Please indicate the following :*

- Seriennummer - *Serial No.*
- Maschinenbezeichnung - *Machines name*
- Herstellungsdatum - *Date of manufacture*
- Artikelnummer - *Article no.*

Die Artikelnummer befindet sich in der Ersatzteilliste. *The article no. is located in the spare parts list.* Die Seriennummer befindet sich am Typschild. *The serial no. is on the rating plate.*

6.2 Hotline Ersatzteile - Spare parts Hotline



+49 (0) 951-96555 -118
ersatzteile@stuermer-maschinen.de



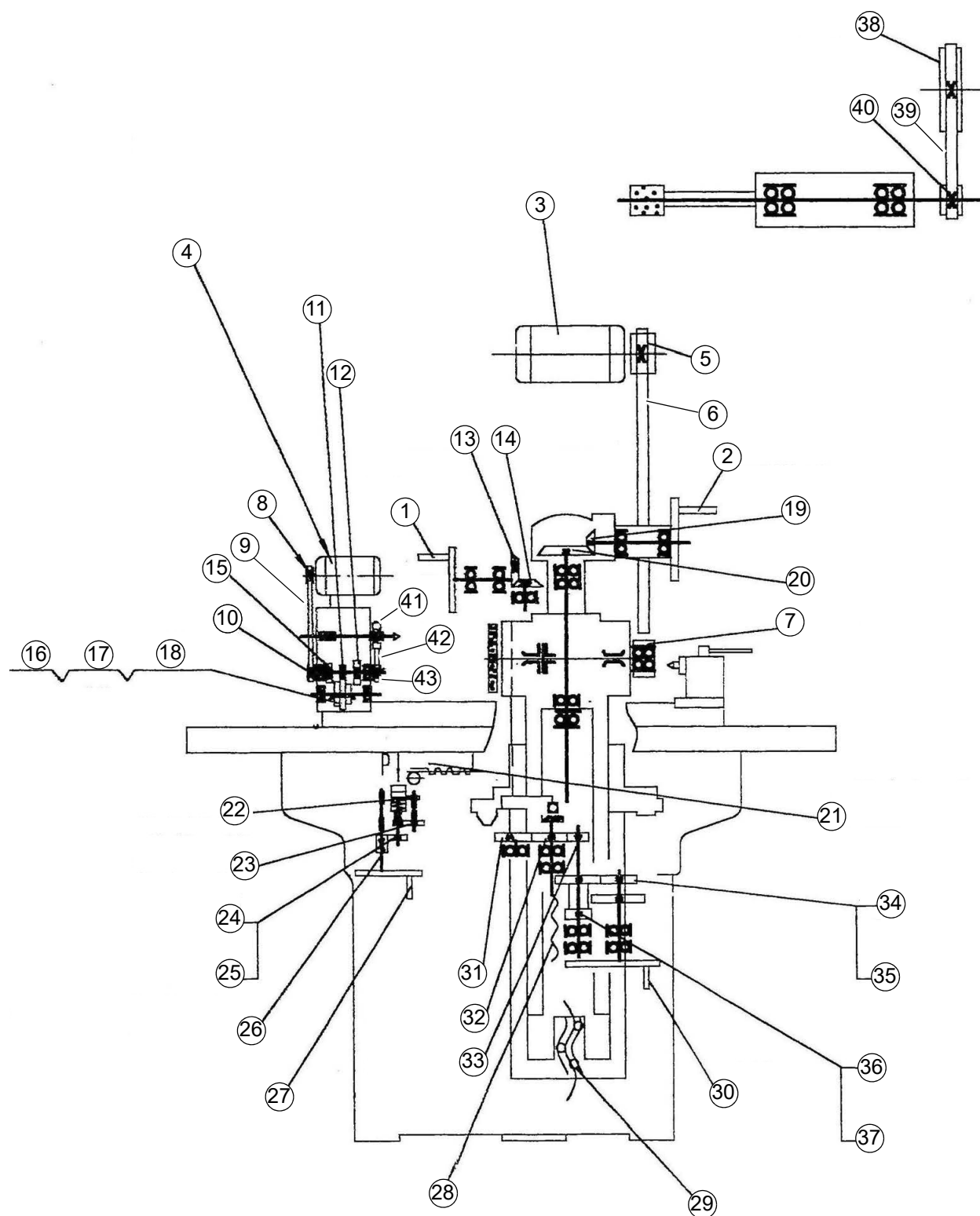
6.3 Service Hotline



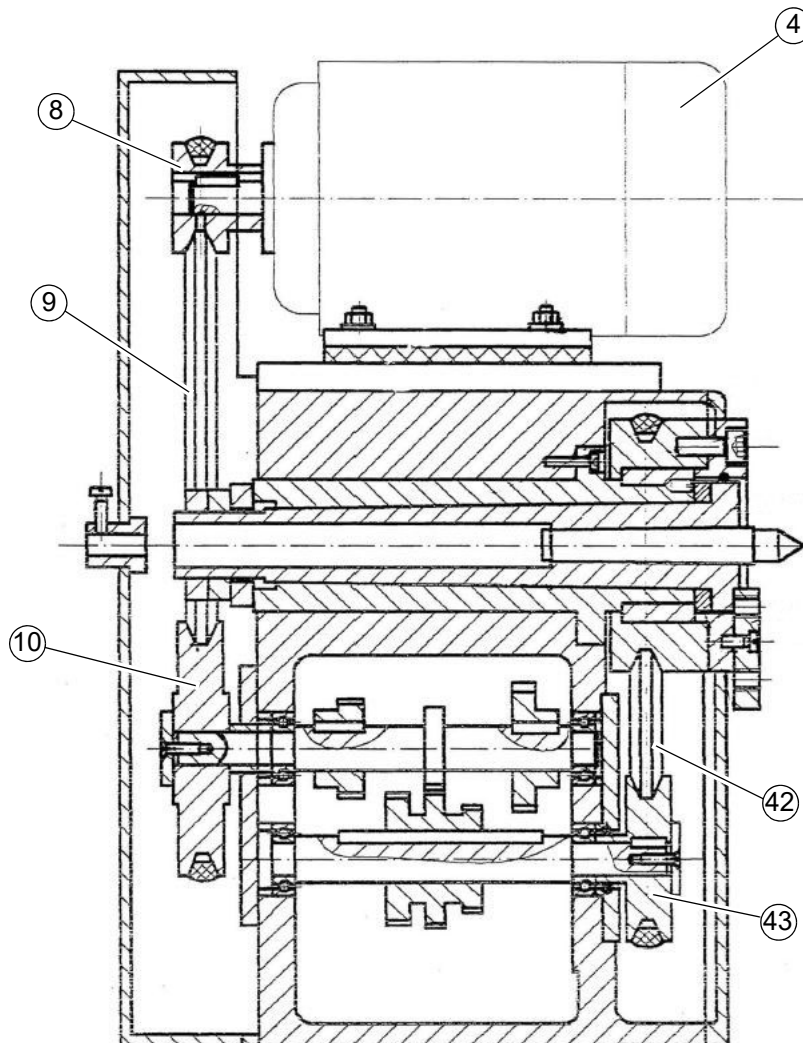
+49 (0) 951-96555 -100
service@stuermer-maschinen.de



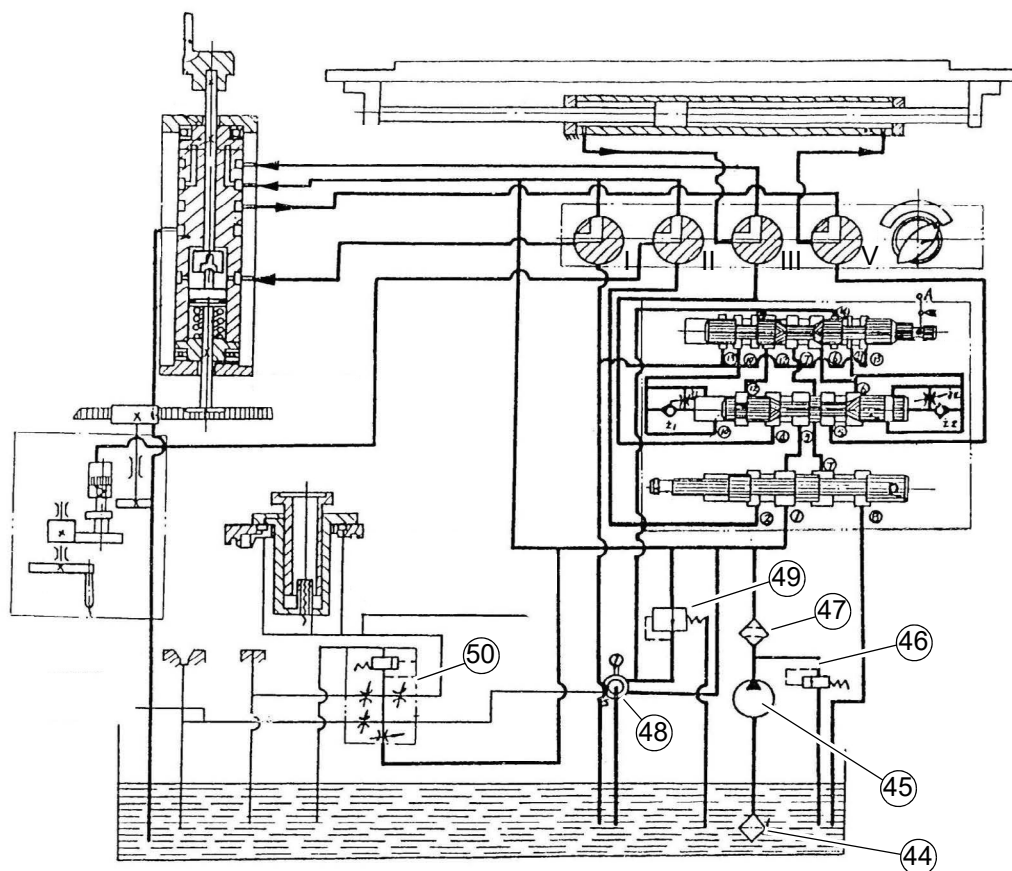
A Mechanische Bauteile - Mechanical components



B Spindelstock (Spindelspitzenantrieb) - Headstock (Spindle point drive)



C Hydraulik - Hydraulic



Ersatzteilliste - Spare part list

Pos.	Bezeichnung	Description	Menge Qty.	Grösse Size	Artikelnummer Item no.
1	Handrad Quervorschub	Cross feed handwheel	1		031210050101
2	Handrad Höheneinstellung Schleifkopf	Grinding head, Handwheel height adjustment	1		031210050102
3	Schleifscheibenmotor	Grinding wheel motor	1	1.1 kW , 2800 rpm Y07132TH	03121005M1
4	Motor Spindelstock	Headstock motor	1	0.18 kW , 1400 rpm 2A05634TH	03121005M2
5	Riemenscheibe	Belt pulley	1	Ø 60	031210050105
6	Riemen	V-belt	1		031210050106
7	Riemenscheibe	Belt pulley	1	Ø 69	031210050107
8	Riemenscheibe	Belt pulley	1	Ø 37	031210050108
9	Riemen	V-belt	1		031210050109
10	Riemenscheibe	Belt pulley	1	Ø 92	031210050110
11	Zahnrad	Gear wheel	1	Z=16 , m=1.5	031210050111
12	Zahnrad	Gear wheel	1	Z=30 , m=1.5	031210050112
13	Zahnrad	Gear wheel	1	Z=15 , m=2 (Z=18 , m2)	031210050113
14	Zahnrad	Gear wheel	1	Z=20 , m=2	031210050114
15	Zahnrad	Gear wheel	1	Z=24 , m=1.5	031210050115
16	Zahnrad	Gear wheel	1	Z=36 (35) , m=1.5	031210050116
17	Zahnrad	Gear wheel	1	Z=30 , m=1.5	031210050117
18	Zahnrad	Gear wheel	1	Z=44 , m=1.5	031210050118
19	Zahnrad	Gear wheel	1	Z=16 , m=2	031210050119
20	Zahnrad	Gear wheel	1	Z=40 , m=2	031210050120
21	Tisch Zahnstange	Table rack	1	m=2	031210050121
22	Zahnrad	Gear wheel	1	Z=17 , m=2	031210050122
23	Zahnrad	Gear wheel	1	Z=43 , m=1.5	031210050123
24	Zahnrad	Gear wheel	1	Z=18 , m=1.5	031210050124
25	Zahnrad	Gear wheel	1	Z=42 , m=1.5	031210050125
26	Zahnrad	Gear wheel	1	Z=16 , m=1.5	031210050126
27	Handrad für die Tischbewegung	Table traverse handwheel	1		031210050127

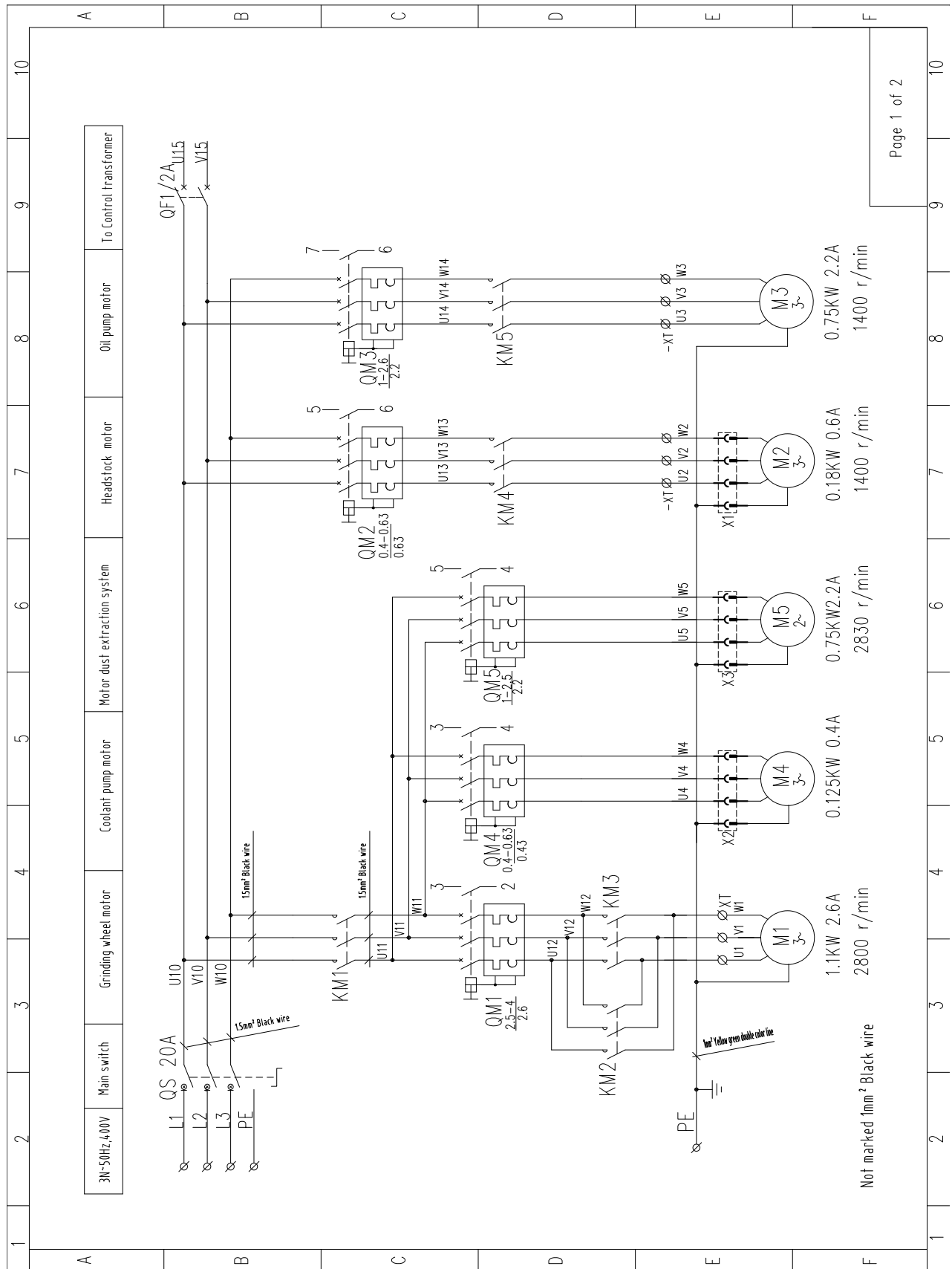
Ersatzteilliste - Spare part list					
Pos.	Bezeichnung	Description	Menge Qty.	Grösse Size	Artikelnummer Item no.
28	Leitspindel Linksgewinde	Lead screw left-hand thread	1	T25 x 3 (8 threads per inch)	031210050128
29	Leitspindel Linksgewinde	Lead screw left-hand thread	1	T25 x 2.5 (8 threads per inch)	031210050129
30	Handrad	Handwheel	1		031210050130
31	Zahnrad	Gear wheel	1	Z=32, m=2	031210050131
32	Zahnrad	Gear wheel	1	Z=26, m=2	031210050132
33	Zahnrad	Gear wheel	1	Z=24, m=2	031210050133
34	Zahnrad	Gear wheel	1	Z=24 (27), m=1.5	031210050134
35	Zahnrad	Gear wheel	1	Z=48 (45), m=1.5	031210050135
36	Zahnrad	Gear wheel	1	Z=24 (30), m=1.5	031210050136
37	Zahnrad	Gear wheel	1	Z=48 (45), m=1.5	031210050137
38	Riemenscheibe Innenschleifaufsatz	Belt pulley Internal grinding attachment	1	Ø 190	031210050138
39	Keilriemen Innenschleifaufsatz	V-belt internal grinding attachment	1		031210050139
40	Riemenscheibe Innenschleifaufsatz	Belt pulley Internal grinding attachment	1	Ø 40	031210050140
41	Riemenscheibe	Belt pulley	1	Ø 93	031210050141
42	Keilriemen	V-belt	1		031210050142
43	Riemenscheibe	Belt pulley	1	Ø 51	031210050143
44	Ansaugfilter	Suction filter	1		031210050144
45	Zahnradpumpe	Gear pump	1	GB-B16	031210050145
46	Überdruckventil	Overflow valve	1	J-10B	031210050146
47	Drahtspaltfilter	Wire gauge filter	1		031210050147
48	Druck Reduzierventil	Pressure reducing valve	1	GY11A-35x25	031210050148
49	Schalter für Manometer	Switch for pressure gauge	1	K-3B	031210050149
50	Schmierstoffstabilisator	Lubricant stabilizator	1	GY35A-1x1	031210050150

Lagerliste - Bearing list					
Pos.	Bezeichnung	Description	Menge Qty.	Grösse Size	Artikelnummer Item no.
Spindelstock	Headstock	Rillenkugellager	4	ISO 6200 GHOST 102 15 x 32 x 9	
		Rillenkugellager	1	ISO W6200 GHOST 200 10 x 30 x 9	
Schleifkopf	Grinding head	Rillenkugellager	2	ISO 6200 GHOST 102 15 x 32 x 9	
		Rillenkugellager	2	ISO 61807 GHOST 1000807 35 x 47 x 7	
Säule	Column	Rillenkugellager	2	ISO 6006 GHOST 106 30 x 55 x 13	
		Rillenkugellager	1	ISO 6205 GHOST 205 25 x 52 x 15	
		Einseitig wirkendes Axialkugellager	1	ISO 51110 GHOST 8110 50 x 70 x 14	
Manueller Tisch	Manual table	Nadelhülsenlager	1	ISO HK2025 GHOST 943/20 20 x 26 x 25	
Mechanismus für den Quervorschub	Transverse feed mechanism	Rillenkugellager	6	ISO 6003 GHOST 103 17 x 35 x 10	
		Rillenkugellager	2	ISO 6004 GHOST 104 20 x 42 x 12	
		Rillenkugellager	2	B7008 -E-T-P4S-UL (FAG Schäffler) GHOST 46108 40 x 68 x 15	

Lagerliste - Bearing list						
Pos.		Bezeichnung	Description	Menge Qty.	Grösse Size	Artikelnummer Item no.
Servoantrieb Ventil	Servo drive valve	Einseitig wirkendes Axialkugellager	Single direction thrust ball bearing	1	ISO 51106 GHOST 8106 30 x 47 x 11	
		Einreihiges Schrägkugellager	Single row angular contact ball bearing	1	7005-B-XL-TVP (FAG Schäffler) GHOST 46105 25 x 47 x 12	
Innen-schleifeinrichtung	Internal grinding attachment	Einreihiges Schrägkugellager	Single row angular contact ball bearing	2	ISO 7204 BEP GHOST 36204 20 x 47 x 14	
Messerkopf	Cutter head	Einreihiges Schrägkugellager	Single row angular contact ball bearing	2	ISO 7008 GHOST 36108 40 x 68 x 15	

6.4 Schaltplan - Wiring diagram

GCM205_wiring-diagram.fm





GCM205 - Elektrische Bauteile - Electric components							
Pos.	Seite Page	Zeile Row	Bezeichnung	Description	Menge Qty.	Grösse Size	Art. Nr. Item no.
M1	1	3	Schleifscheibenmotor	Grinding wheel motor	1	1.1 kW , 2800 rpm Y07132TH	03121005M1
M2	1	7	Motor Spindelstock	Headstock motor	1	0.18 kW , 1400 rpm 2A05634TH	03121005M2
M3	1	8	Ölpumpenmotor (Hydraulik)	Oil pump motor (Hydraulic)	1	0.75 kW , 1400 rpm Y07134TH	03121005M3
M4	1	5	Motor Kühlmittelpumpe	Coolant pump motor	1	0.125 kW JCB-22TH	03121005M4
M5	1	6	Motor Staubabsaugung	Dust extraction motor	1	0.75 kW , 2830 rpm YS7122TH	03121005M5
QS	1	1	Hauptschalter	Main switch	1	Schneider 20A	03121005QS
QF1	1	9	Schutzschalter	Circuit breaker	1	Schneider C65N-D2/2P 2A	03121005QF1
QF2	2	2	Schutzschalter	Circuit breaker	1	Schneider C65N-D6/1P 6A	03121005QF2
QF3	2	2	Schutzschalter	Circuit breaker	1	Schneider C65N-D1/1P 1A	03121005QF3
KM1	1	4	Motor Steuer Schütz	Motor control contactor	1	Schneider LC1-D0911M5C	03121005KM1
QM1	1	4	Motorschutzschalter	Motor circuit breaker	1	GV2-ME08C 2.5-4A	03121005QM1
QM2	1	7	Motorschutzschalter	Motor circuit breaker	1	GV2-ME04C 0.4-0.63A	03121005QM2
QM3	1	8	Motorschutzschalter	Motor circuit breaker	1	GV2-ME07C 1.6-2.5A	03121005QM3
QM4	1	5	Motorschutzschalter	Motor circuit breaker	1	GV2-ME04C 0.4-0.63	03121005QM2
QM5	1	6	Motorschutzschalter	Motor circuit breaker	1	GV2-ME07C 1.6-2.5A	03121005QM5
KM2	1	3	Schützsteuerung M1 Uhrzeigersinn	Contactor Control M1 CW	1	Schneider LC1-D0911M5C	03121005KM1
KM3	1	4	Schützsteuerung M1 Gegenuhrzeigersinn	Contactor Control M1 CCW	1	Schneider LC1-D0911M5C	03121005KM1
KM4	1	7	Motor Schütz	Motor contactor	1	Schneider LC1-D0911M5C	03121005KM1
KM5	1	8	Motor Schütz	Motor contactor	1	Schneider LC1-D0911M5C	03121005KM1
TC	2	2	Transformator	Transformer	1	JBK5-250 AC 400/24V	03121005TC
G9SA	2	4	Sicherheitsmodul	Safety module	1	Omron G9SA	03121005G9SA
KA0			Relais	Relay	1		03121005KA0
SB0			Drucktaster	Push button	1		03121005SB0
EL			Arbeitsleuchte für Werkzeugmaschinen	Machine tool working lamp	1		03121005EL
LH1			Kontrollleuchte	Control light	1	GQ22-E/24V/W	03121005LH1
SB0			Drucktaster Steuerung	Control push button	1		03121005SB0
SQ			Innenschleifenaufsatz Mikroschalter zur Drehrichtungsumkehr	Internal grinding attachment Microswitch for reversing the direction of rotation	1	LXW2-11 1a1b	03121005SQ
SB1			Not-Halt Taster	Emergency stop button	1	Schneider XB2BS542C×2 Ø22	03121005SB1
SB11			Not-Halt Taster	Emergency stop button	1	Schneider XB2BS542C×2 Ø22	03121005SB1
SB2			Stopp Taster	Stop button	1	GQ25-22E/24V/R	03121005SB2
SB3			Stopp Taster	Stop button	1	GQ25-22E/24V/R	03121005SB2
SB4			Stopp Taster Motor Spindelstock	Stop button Headstock motor		GQ25-22E/24V/R	03121005SB2
SB5			Stopp Taster Motor Ölpumpe	Stop button Oilpump motor	1	GQ25-22E/24V/R	03121005SB2
SB6			Start Taster Schleifscheibenmotor Uhrzeigersinn	Start button Grinding wheel motor CW	1	GQ25-22E/24V/G	03121005SB6
SB7			Start Taster Schleifscheibenmotor Uhrzeigersinn	Start button Grinding wheel motor CW	1	GQ25-22E/24V/G	03121005SB6
SB8			Start Taster Schleifscheibenmotor Gegenuhrzeigersinn	Start button Grinding wheel motor CCW	1	GQ25-22E/24V/G	03121005SB6
SB9			Start Taster Motor Spindelstock	Headstock motor start button	1	GQ25-22E/24V/G	03121005SB6
SB10			Start Taster Ölpumpenmotor (Hydraulik)	Oil pump motor (Hydraulic) start button	1	GQ25-22E/24V/G	03121005SB6

7 Malfunctions

Malfunction	Possible cause	Solution
Chatter marks as a result of vibrations.	- o The anchoring of the machine is not stable enough. - o Adjusting screws Lock nuts in the machine base are loose. - o Work tables do not run smoothly. - o Grinding wheel does not sit firmly on the flange. - o Flange is not tight on the spindle. - o Grinding wheel and flange are not well balanced. - o Grinding wheel is not homogeneous. - o Grinding wheel is not well dressed. - o Too much pressure on the spindle. - o Transmission of vibrations from neighbouring machines. - o Connection between motor and spindle is loose or parts are damaged.	- o Stabilize the anchorage. - o Check alignment, tighten lock nuts. - o Slideway oil does not reach the lubrication points. - o Replace wheel between grinding wheel and flange. - o Clean contact surfaces, check tightness. - o Balance grinding wheel and flange. - o Remove the grinding wheel and balance or replace it. - o Check position of diamond and puller, replace diamond if necessary. - o Excessive infeed of the grinding wheel. - o Improve anchoring of the machine or move the machine to a vibration-free location. - o Fix or replace connecting parts.
Flutter marks on the surface of the workpiece	- o Uneven running of the grinding wheel. - o Grinding wheel too hard or blunt. - o Vibrations coming from the building or the street.	- o Voltage phases of the power supply are not uniform. - o Use a softer or coarser-grained grinding wheel. - o Use vibration plates or stabilize anchoring.
Beam pattern	o Spindle bearing defective, running noises ?	o Change spindle bearing
Comma-shaped lines are created during precision grinding	- o Coolant dirty. - o Dirt on workpiece.	- o Clean coolant or use filter. - o Clean the inside of the grinding wheel cover or replace the grinding wheel.
burn marks and cracks	- o Grinding wheel too hard. - o Pendulum speed too high - o Grinding wheel is dull or smeared. - o Too much material removal. - o Ineffective cooling	- o Use a softer or coarser-grained grinding wheel. - o Reduce the oscillation speed. - o Remove the grinding wheel. - o Reduce crossfeed - o Use coolant suitable for the grinding wheel and the material to be machined.

Malfunction	Possible cause	Solution
Pendulum movement of the table does not start.	Hydraulic gear pump does not supply oil.	- Check the direction of rotation of the motor or top up oil. - Check pressure

8 Appendix

8.1 Copyright

Optimum Maschinen Germany GmbH

This document is protected by copyright. All derived rights are reserved, especially those of translation, re-printing, use of figures, broadcast, reproduction by photo-mechanical or similar means and recording in data processing systems, either partial or total.

8.2 Changes

Any changes in the construction, equipment and accessories are reserved for reasons of enhancement. Therefore, no claims may be derived from the indications and descriptions. Errors excepted!

8.3 Product follow-up

We are required to perform a follow-up service for our products which extends beyond shipment.

We would be grateful if you could send us the following information:

- ☐ Modified settings
- ☐ Experiences with the grinding machine that are important for other users
- ☐ Recurring malfunctions
- ☐ Difficulties with the documentation

Optimum Maschinen Germany GmbH

Dr.-Robert-Pfleger-Str. 26
Germany, D-96103 Hallstadt

email: info@optimum-maschinen.de

8.4 Liability claims for defects / warranty

Besides the legal liability claims for defects of the customer towards the seller, the manufacturer of the product, OPTIMUM GmbH, Robert-Pfleger-Straße 26, D-96103 Hallstadt, does not grant any further warranties unless they are listed below or were promised as part of a single contractual provision.

- ☐ The processing of the liability claims or of the warranty is performed as chosen by OPTIMUM GmbH either directly or through one of its dealers.
Any defective products or components of such products will either be repaired or replaced by components which are free from defects. Replaced products or components become our property.
- ☐ The automatically generated original proof of purchase which shows the date of purchase, the type of machine and the serial number, if applicable, is the precondition in order to assert liability or warranty claims. If the original proof of purchase is not presented, we are not able to perform any services.
- ☐ Defects resulting from the following circumstances are excluded from liability and warranty claims:
 - Using the product beyond the technical options and proper use, in particular due to overstraining of the machine.
 - Self-inflicted damage due to incorrect operation and disregard of our operating instructions
 - Inattentive or incorrect handling and use of improper equipment
 - Unauthorized modifications and repairs
 - Insufficient installation and safeguarding of the machine
 - Disregarding the installation requirements and conditions of use
 - atmospheric discharges, overvoltage and lightning strokes as well as chemical influences

- Neither are the following items covered by liability or warranty claims:
 - Wearing parts and components which are subject to normal and intended wear, such as V-belts, ball bearings, lighting, filters, seals, etc.
 - Non reproducible software errors
- Services provided by OPTIMUM GmbH or one of its vicarious agents for fulfilment within the scope of an additional guarantee are neither an acknowledgement of a defect nor an acknowledgement of the obligation to perform. These services neither delay nor interrupt the warranty period.
- The court of jurisdiction for legal disputes between businessmen is Bamberg.
- If any of the aforementioned agreements is totally or partially inoperative and/or invalid, a provision which nearest approaches the intent of the guarantor and remains within the framework of the limits of liability and warranty which are specified by this contract is deemed agreed.

8.5 Storage

ATTENTION!

Incorrect and improper storage might result in damage or destruction of electrical and mechanical machine components.

Store packed and unpacked parts only under the intended environmental conditions.

Follow the instructions and information on the transport box:

- Fragile goods (Goods require careful handling)
- Protect against moisture and humid environment

- Prescribed position of the packing case (Marking of the top surface - arrows pointing to the top)
- Maximum stacking height

Example: not stackable - do not stack further packing case on top of the first one.



Please contact Optimum Maschinen Germany GmbH if the Grinding machine grinding machine and accessories have to be stored for longer than three months and under other than the specified ambient conditions.

8.6 Re-export

All contractual products and technical know-how are supplied by Optimum Maschinen Germany GmbH in compliance with the currently valid AWG/AWV/EG-Dual-Use Regulation as well as the US export regulations and are intended for use and retention in the country of delivery agreed with the customer. If the customer intends to re-export contractual products, he is obliged to comply with US, European and national export regulations. The re-export of contract products contrary to these provisions is prohibited.

The customer must inform himself independently about the currently valid provisions and regulations (Bundesausfuhramt, 65760 Eschborn/Taunus or US Department of Commerce, Office of Export Administration, Washington D. C. 20230). Irrespective of whether the customer specifies the final destination of the delivered contractual products, it is the customer's own responsibility to obtain any necessary approval from the respective competent foreign trade authorities before exporting such products. Optimum Maschinen Germany GmbH has no obligation to provide information in this respect and gives no guarantee that the contractual products comply with the respective export regulations. The customer is also not entitled to claim that Optimum Maschinen Germany GmbH adapts the contractual products to the respective export regulations.

Any forwarding of contractual products by customers to third parties, with or without the knowledge of Optimum Maschinen Germany GmbH, requires at the same time the transfer of the export licence conditions. The customer shall be fully liable in the event of non-compliance with the relevant provisions.

Without prior regulatory approval, the customer is not permitted to export contract products directly or indirectly to countries subject to a US embargo or to natural or legal persons of these countries as well as to natural or legal persons on US, European or national prohibited lists (e.g.: "Specifically Designated Nationals and Blocked Persons", "Entity List"/"Denied Persons List"). Furthermore, it is prohibited to supply contract products to natural or legal persons who are in any way connected with the support, development, production or use of chemical, biological or nuclear weapons of mass destruction.

8.7 Advice for disposal / Options of re-use

Please dispose of your equipment in an environmentally friendly manner, by not placing waste in the environment but in a professional manner.

Please do not simply throw away the packaging and later the disused machine, but dispose of both in accordance with the guidelines laid down by your city council/local authority or by an authorised disposal company.

8.7.1 Decommission

CAUTION !

Immediately decommission used machines in order to avoid later misuse and endangering of the environment or of persons.

Cut the connection cable.

Remove all environmentally hazardous operating fluids from the used device.

If applicable remove batteries and accumulators.

Disassemble the machine if required into easy-to-handle and reusable assemblies and component parts.

Dispose of machine components and operating fluids using the intended disposal methods.



8.7.2 Disposal of new device packaging

All used packaging materials and packaging aids from the machine are recyclable and generally need to be supplied to the material reuse.

The packaging wood can be supplied to the disposal or the reuse.

Any packaging components made of cardboard box can be chopped up and supplied to the waste paper collection.

The films are made of polyethylene (PE) and the cushion parts are made of polystyrene (PS). These materials can be reused after reconditioning if they are passed to a collection station or to the appropriate waste management enterprise.

Only forward the packaging materials correctly sorted to allow direct reuse.

8.7.3 Disposal of the machine

INFORMATION

Please take care in your interest and in the interest of the environment that all component parts of the machine are only disposed of in the intended and admitted way.

Please note that the electrical devices comprise a variety of reusable materials as well as environmentally hazardous components. Please ensure that these components are disposed of separately and professionally. In case of doubt, please contact your municipal waste management. If appropriate, call on the help of a specialist waste disposal company for the treatment of the material.



8.7.4 Disposal of electrical and electronic components

Please make sure that the electrical components are disposed of professionally and according to the statutory provisions.

The device is composed of electrical and electronic components and must not be disposed of as household waste. According to the European Directive regarding electrical and electronic used devices and the implementation of national legislation, used power tools and electrical machines need to be collected separately and supplied to an environmentally friendly recycling centre.

As the machine operator, you should obtain information regarding the authorised collection or disposal system which applies for your company.

Please make sure that the electrical components are disposed of professionally and according to the legal regulations. Please only throw depleted batteries in the collection boxes in shops or at municipal waste management companies.

8.7.5 Disposal of lubricants and coolants

ATTENTION!

Please imperatively make sure to dispose of the used coolant and lubricants in an environmentally compatible manner. Observe the disposal instructions of your municipal waste management companies.



INFORMATION

Used coolant emulsions and oils should not be mixed since it is only possible to reuse oils without pre-treatment when they have not been mixed.

The disposal instructions for used lubricants are made available by the manufacturer of the lubricants. If necessary, request the product-specific data sheets.



8.8 Disposal through municipal collection facilities

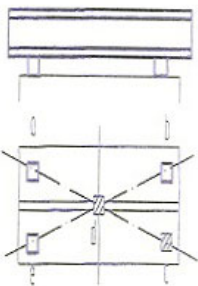
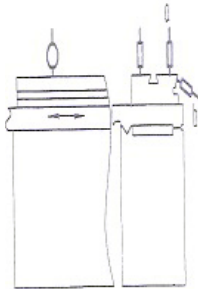
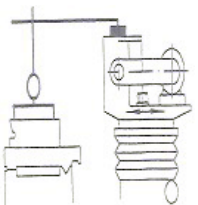
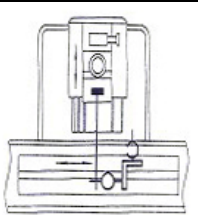
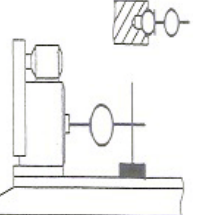
Disposal of used electrical and electronic components

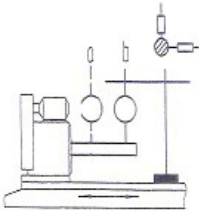
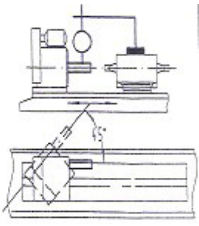
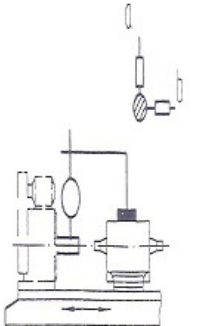
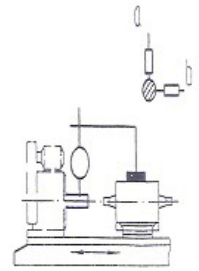
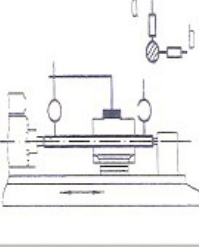
(Applicable in the countries of the European Union and other European countries with a separate collecting system for those devices).

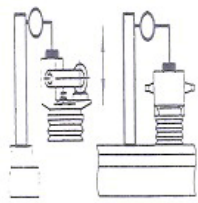
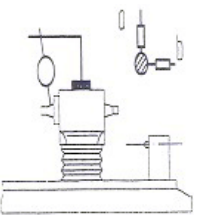
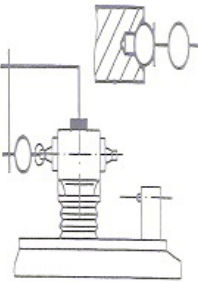
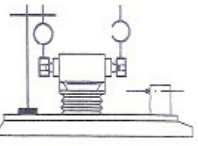
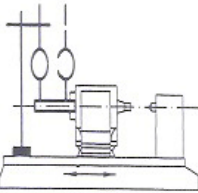
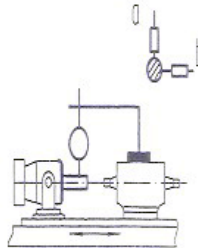
The sign on the product or on its packing indicates that the product must not be handled as common household waste, but that it needs to be disposed of at a central collection point for recycling. Your contribution to the correct disposal of this product will protect the environment and the public health. Incorrect disposal constitutes a risk to the environment and public health. Recycling of material will help reduce the consumption of raw materials. For further information about the recycling of this product, please consult your District Office, municipal waste collection station or the shop where you have purchased the product.

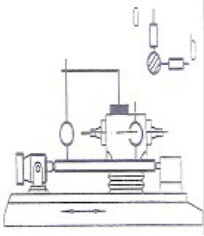
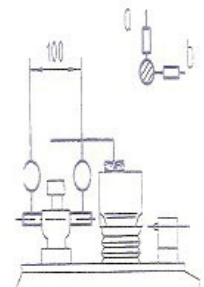
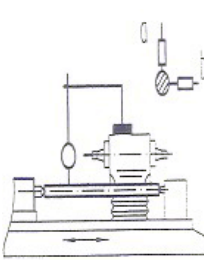
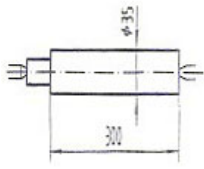
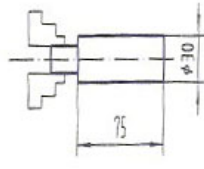
9 Genauigkeitsbericht - Accuracy report

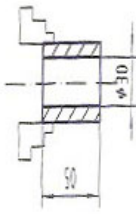
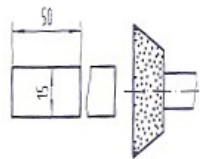
Der Abschlussbericht der Genauigkeit liegt der Maschine bei. *The final accuracy report is enclosed with the machine.*

No.	Tested Item	Figure	Permitted error	Measured error	Explanation
G1	Flatness of table surface		Whole table surface 0.02 In any measure length of 250 0.008		
G2	Parallelism of table surface & its parallelism to longitudinal table motion a. Table surface b. Guiding surface of work-head & tailstock		a & b In any measure length of 300 mm 0.01		
G3	Table surface parallelism to movement of wheel head		In the measure length of 100 mm 0.01		
G4	Perpendicularity of movement of wheel head regarding to movement of work table		In the whole travel 0.015		
G5	Axial oscillation of the spindle of headstock		0.005		

No.	Tested Item	Figure	Permitted error	Measured error	Explanation
G6	Taper of headstock spindle runs true		a 0.005 b 0.01		
G7	Levelness of axis of spindle of swivelling headstock		0.015		
G8	Parallelism of the axis of headstock spindle in respect to the table movement a. On vertical plane b. On horizontal plane		a & b 0.008 on 100mm		
G9	Parallelism of tailstock quill in respect to the table surface a. On the vertical plane b. On the horizontal plane		a & b 0.008 on 100mm		
G10	Tailstock axis in line with headstock axis a. On the vertical plane b. On the horizontal plane		On 300 a. 0.015 (headstock lower only) b. 0.015		

No.	Tested Item	Figure	Permitted error	Measured error	Explanation
G11	Perpendicularity of the guide of the column in respect to table a. On the longitudinal plane of table b. On the normal plane of table		a & b 0.02 On 100mm		
G12	Taper of wheel spindle for true running		0.005		
G13	Wheel spindle for axial slip		0.005		
G14	Parallelism of axis of wheel spindle in respect to table		0.02		
G15	Parallelism of axis of internal grinding attachment in respect to table movement (On the vertical plane)		0.02		
G16	Parallelism of axis of the work head spindle in respect to work table movement a. On the vertical plane b. On the horizontal plane		a & b 0.01 On 100mm		

No.	Tested Item	Figure	Permitted error	Measured error	Explanation
G17	Work head axis in with tailstock axis a. On the vertical plane b. On the horizontal plane		a & b 0.015 On 300mm		
G18	Parallelism of left tailstock quill in respect to table surface a. On the vertical plane b. On the horizontal plane		a & b 0.01 On 100mm		
G19	Left tailstock axis in line with right tailstock a. On the vertical plane b. On the horizontal plane		a & b 0.015 On 300mm		
P1	Accuracy of external grinding on centres	 Material: steel 45*	a. Circularity 0.0015 b. Regularity of diameter in a longitudinal section 0.005		
P2	Accuracy of external grinding on chuck	 Material: steel 45*	a. Circularity 0.0025		

No.	Tested Item	Figure	Permitted error	Measured error	Explanation
P3	Accuracy of external grinding on chuck	 Material : steel 45#	a. Circularity 0.0025		
P4	Accuracy of grinding cutter surface	 Material : W18Cr4v ; Hardness : HRC62 - 65	a. Linearity 0.005		

EC - Declaration of Conformity

according to Machinery Regulation 2023/1230 Annex V Part A

The manufacturer / distributor Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26
D - 96103 Hallstadt, Germany

hereby declares that the following product

Product designation: Surface and cylindrical grinding machine

Type designation: GCM205

fulfils all the relevant provisions of the Machinery Regulation specified above and the additionally applied directives (in the following) - including the changes which applied at the time of the declaration.

Description:

Hand controlled grinding machine

The following additional EU Directives have been applied:

EMC Directive 2014/30/EC ; Restriction of the use of certain hazardous substances in electrical and electronic equipment 2015/863/EU

The following harmonized standards were applied:

EN ISO 16089:2016-06 Machine tools - Safety– Stationary grinding machines

EN 60204-1:2019-06 Safety of machinery - Electrical equipment of machines - Part 1: General requirements

EN ISO 13849-1:2016-06 Safety of machinery - Safety related parts of controls - Part 1: General design principles

EN ISO 13849-2:2013-02 Safety of machinery - Safety related parts of controls - Part 2: Validation

EN ISO 12100:2011-03 Safety of machinery - General principles for design - Risk assessment and risk reduction

EN IEC 61000-6-2:2019-11 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments

Name and address of the person authorized to compile the technical file:

Kilian Stürmer, phone: +49 (0) 951 96555 - 800



Kilian Stürmer (CEO, General Manager)

Hallstadt, 2023-11-07

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